QMS® 4525 Print System System Administrator's Guide

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QMS 4525 Print System Administrator''s Guide

1

Introduction

In This Chapter . . .

- About this manual
- Typographic conventions
- Shipment contents
- QMS product registration
- Printer and power-up diagnostics
- Print system software upgrades

About this Manual

This manual is designed to help the system administrator configure, control, monitor, and maintain the QMS 4525 printer, including the optional sorters and the stacker/stapler.

■ **Chapter 1 - Introduction**

Introduces the manual, describes typographic conventions, lists the contents of your shipment, tells you how to register the warranty on your printer, and covers power-up diagnostics and printer diagnostics. Also covered in this chapter are the instructions on how to reinstall system software in case of system failure and how to install system upgrades.

■ **Chapter 2 - Printer Configuration**

Explains how to use the keys on the printer control panel, and how to use the menu system to control and configure the printer.

■ **Chapter 3 - Operator Control Menu**

Describes how to specify the default number of copies to print, whether to print in duplex or tumble duplex (or neither), whether to collate or use an optional sorter bin or the stacker/stapler, what the default page orientation is, which paper size combination the paper trays are set up for, and whether to use accounting.

■ **Chapter 4 - Communications Menu**

Describes the Communications menu that you use to set communications timeouts and how to configure the serial, parallel, AppleTalk, and optional communications interfaces.

■ **Chapter 5 - Emulations Menu**

Describes the Emulations menu that you use to set the default configurations of the PostScript, CCITT, PCL 5, HP-GL, imPRESS, Lineprinter, and LN03 Plus emulations, and the ESP default language.

■ **Chapter 6 - Special Pages and Startup Options Menus**

Describes the Special Pages Header, Error, and Trailer Pages
options that you use to turn header and/or trailer page printing on
and off, to describe the input bins to print these pages from, and
to explain whether to print timing messages on the error page.
Special Pages also allows you to select the status page type.
Startup Options describes the Do Start Page, Do Sys Start, and
Do Error Handler options.

■ **Chapter 7 - Memory Menu**

Explains memory management and describes the Memory
menus that you use to set the default sizes of the following mem-
ory clients: spool buffer, PS heap, PS fonts, emulations, emula-
tions temporary space, disk cache, and printer memory.

■ **Chapter 8 - Engine, Miscellaneous, and Disk Operations
Menus**

Explains how to use the Engine menu to set up default laser
intensity, test page, image alignment, input bin names, low toner
action, manual feed timeout, gamma correction, sorter setup, and
finisher setup (if installed). It also explains how to use the Miscel-
laneous menu to restore the printer to factory default settings, set
the printer name for a console system, set the control panel lan-
guage, and set clock operations. The Disk Operations menu
allows you to perform file operations using the printer 's hard
disks.

■ **Chapter 9 - Using the Sorter**

Describes how to use the 20-bin and 40-bin sorters.

■ **Chapter 10 - Using the Stacker/Stapler**

Describes how to setup and use the stacker/stapler, and how to
use offset stacking.

■ **Chapter 11 - Printer-Host Connection**

Briefly explains your printer's Simultaneous Interface Operation
(SIO) and Emulation Sensing Processor (ESP) technology. Then
the chapter describes how to connect a host to the printer's

LocalTalk, parallel, or serial port, and how to test communications.

■ **Appendix A— QMS Customer Support**

Lists useful telephone numbers and describes how to communicate with QMS through Q-FAX, the QMS Corporate Bulletin Board, CompuServe, Internet, and QMS Customer Technical Assurance.

■ **Appendix B — Cable Pinouts**

Provides the recommended pinouts for LocalTalk, serial, IBM PC/XT, IBM PC/AT, and both Centronics and Dataproducts parallel cables.

■ **Appendix C- Manual Notices**

Provides safety and FCC compliance statements.

■ **Appendix D— Technical Specifications**

Provides technical specifications for the printer.

■ **Appendix E- Manual Updates**

Provides updated information, such as new DOC commands or PostScript operators, that may be created for this printer, but are usually documented in other QMS manuals. Information in this section will be merged into other QMS manuals as they are revised.

Typographic Conventions

The following typographic conventions are used throughout this manual:

`Mixed-Case Courier`	Text you type, and messages and information displayed on the console.
`UPPERCASE or Mixed-Case Courier`	Information displayed in the printer message window.
`Mixed-Case Italic Courier`	Variable text you type. Replace the italicized word(s) with information specific to your printer or computer.
bold	PostScript operators and DOS, DOC, CCITT, VMS, and UNIX commands.
lowercase italic	Variable information in text and command variables.
UPPERCASE	File and utility names.
↵	Press the Enter key (PC) or Return key (Macintosh).

» Note: Notes contain tips, extra information, or important information that deserves emphasis or reiteration.

🖑 **Caution**: Cautions present information that you need to know to avoid equipment damage or extreme annoyance.

●⁕ **WARNING!** Warnings indicate the possibility of personal injury if a specific procedure is not performed exactly as described in the manual.

ACHTUNG! Bitte halten Sie sich exakt an die im Handbuch beschriebene Vorgehensweise, da sonst Verletzungsgefahr bestehen könnte

A Good Location for Your Printer

Your QMS 4525 Print System requires an appropriate operating environment.

Physical Requirements

The location should meet the following requirements:

- Be away from cooling sources, heating sources, extreme temperature changes, direct sunlight, excessive dust, and corrosive chemicals or vapors.

- Be away from any strong electromagnetic field (such as that created by an air conditioner) and excessive vibration.

- Have a temperature range of 41° F (5° C) to 95° F (35° C).

- Have a relative humidity range of 30% to 80%.

- Be well ventilated. You should have at least 24" (600 mm) on each side of the printer for adequate access and ventilation.

- Have a room volume of at least 883 feet^3 (25 meters^3)

- Have room ventilation of at least 442 feet^3/hour (12.5 meters^3/hour). This minimum ventilation rate, with the minimum room volume given above, holds ozone buildup within acceptable levels. To remove heat, additional ventilation may be required.

- Be as close to the host as possible: 6 feet (approximately 1.8 meters) or less for parallel communication, 25 feet (approximately 7.5 meters) or less for serial communication.

- Be level and capable of supporting the printer weight:

  Printer with 20-bin sorter - 1,028 lbs (approx.)
  Printer with 40-bin sorter - 1,124 lbs (approx.)

U.S. Electrical Requirements

Following are U.S. electrical requirements.

- Single-phase 230 V (±10%); max. 16 A; 60 Hz (±2%)

■ The electrical connection should be direct, not via a branched socket.

■ Noise-generating equipment should not be connected to the same electrical outlet as the printer.

Shipment Contents

Your shipment contains the following:

■ The QMS-PS 4525 Print System

■ *The QMS 4525 Print System User's Guide*

■ The PS Executive Series Utilities software (on disk)

■ The *QMS Crown Document Options Commands* documentation

■ The *QMS Crown Technical Reference* documentation

■ The *QMS Crown Remote Console User's Guide*

■ The *QMS Crown Network Notes* (on disk)

■ The *imPRESS Programmer's Guide*

■ The *HP PCL 5 Technical Reference* manual

■ Two binders

■ Two bottles of toner

■ A warranty card

Make sure all items are included in your shipment before setting up you printer. If any items are missing or damaged, contact your shipping company or your QMS vendor. See appendix A, "QMS Customer Support," for product sales and support information.

QMS Product Registration

Call QMS toll-free at 1 (800) 637-8049 (US) to register your QMS product. For contact information outside of the United States, refer to Appendix A, "QMS Customer Support."

Please take a few minutes to call. Your input helps us to continue developing new products to address your changing printing needs.

Power-up Sequence Control Panel

» Note: During the first 10 seconds after the printer is turned on, you can press any key on the control panel or the console (if available) to select that device as the BootROM input device. Once a device is selected, the other device is disabled for input during the BootROM process. The default BootROM input device is the control panel.

The following sequence of messages display on the control panel to indicate the status of the BootROM:

```
Initializing...
```

This message indicates that the BootROM is initializing. When the initialization is complete, the BootROM runs a set of internal diagnostics that take about 30 seconds to complete. As each diagnostic is started a message is displayed identifying the diagnostic that is being executed. If an error is detected, the error code is displayed and the next test is started. (See "Power-up Diagnostics," later in this chapter, for the list of diagnostics and messages.)

When the diagnostics are complete, the following message displays in the message window:

```
QMS Softload x.x  Ready to boot
```

After this message displays, a 10 second waiting period begins. Any key pressed during this period aborts the auto boot process and accesses the BootROM User menu. If no key is pressed during the 10

second period, the BootROM starts the auto boot process and the control panel displays

```
Boot Systemloading    /
```

The bar at the end of the display keeps rotating to indicate that the print system is downloading. When the downloading is completed, printer initialization begins and the control panel displays

```
INITIALIZING
```

See Chapter 8, the "Control Panel—BootROM User Menu" section, for more information on this menu.

Power-up Diagnostics Control Panel

At power-up, the print system performs the following diagnostics via the control panel:

ROM	FLOPPY DISK controller
DRAM	Z80 - Appletalk I/F
CACHES	HARD DISK controller
TLB	PARALLEL port
NOVRAM/TOD	OPTIONAL I/O 1 Board
VIA	OPTIONAL I/O 2 Board
ENGINE duart	FLOATING POINT UNIT

As each diagnostic is started a message is displayed identifying the diagnostic that is being executed.

Printer Diagnostics Console

The following diagnostic tests are available from the console:

1. DRAM	8. Parallel Port
2. CPU	9. Floppy Disk
3. Engine	10. VIA
4. Hard Disk	11. NOVRAM/TOD
5. Optional I/O	12. Perform all tests
6. AppleTalk	13. View test results
7. Serial Port	14. Return to Main Menu

These diagnostic tests are intended for use by QMS Service Engineers. See Chapter 8, the "Console—BootROM User Menu" section, for more information on this menu. Menu selection 12, Perform all tests, is the comprehensive self-test.

Printer Start-up Page

The printer start-up page prints each time the printer is turned on. The page provides the following printer information:

■ Product name
The product name, "QMS 4525," prints in the upper-left corner of the page.

■ Printer name
The name of the printer specified with the Printer Name option of the Administrtion/Miscellaneous menu.

■ Pages printed
The number of pages printed by the current controller/hard disk configuration.

■ Interface
   Current configurations of the standard and optional interfaces.

■ Release
   Printer firmware release date.

Enabling/Disabling the Start-up Page

To enable printing of the start-up page each time the printer is turned on, set the Do Start Page option in the Administration/Startup Options menu to Yes. To disable the start-up page, set the option to No. The factory default setting is Yes.

Installing Print System Software

Occasionally, you may need to reinstall the printer system software for your QMS 4525 Print System or to install a software upgrade. Print system software for your printer is supplied on eight 3.5" 1.44 MB diskettes.

Installing system software requires copying the contents of the disks to the printer's internal hard disk. You load the software through the control panel, or through the parallel or LocalTalk port using PS Executive Series Utilities (see the utilities on-line help for details). The control panel loading procedure is explained in the next section.

Installing from the Control Panel

To install system software from the control panel, you need to access the BootROM User menu and perform the following steps:

1   **Turn the system off and back on again. The following message displays in the message window:**

   ```
   QMS Softload x.x  Ready to boot
   ```

2   **Once this message displays, you have 10 seconds to press any key.**

Any key pressed during this period, aborts the auto boot process
and accesses the BootROM User menu. The following message
displays:

```
QMS Softload x.x  Boot System
```

» Note: If 10 seconds passes before you press any key, BootROM starts
the auto boot and the

```
   Boot Systemloading   /
```
message displays. You must return to step 1. Also, if BootROM detects
an error while trying to boot the print system, the BootROM User menu
displays.

3   **After the BootROM User menu displays, press the Previous
or Next key until the following displays in the message win-
dow:**

```
QMS Softload x.x  Install To Disk
```

4   **Press the Enter key to access the Install to Disk menu and
the following displays:**

```
Install To Disk    Diskette
```

5   **Press the Enter key to load the software from the system dis-
kettes. The following message displays**

```
Install To Disk    Target Disk 6
```

6   **Press the Previous or Next keys to display other disks or
press the Enter key to select hard disk 6 as the target.**

Disk 6 is the printer's internal hard disk.

7   **Open the printer's left-side door to access the floppy disk
drive.**

8   **Insert the first diskette into the floppy disk drive, and then
press the Enter key.**

9 **When BootROM is done with the diskette, it prompts for the next diskette by displaying**

```
Install to Disk   Next Diskette
```

To continue, place the next diskette in the disk drive and press the Enter key. This process continues until all the diskettes have been loaded. Remember, press the Enter key after inserting each diskette.

10 **You have now completed installing the system software and are ready to boot the system.**

After the contents of all the diskettes have been loaded, press the Back key. The message window displays the following message:

```
QMS Softload x.x   Install To Disk
```

11 **Press the Previous or Next key until the message window displays:**

```
QMS Softload x.x   Boot System
```

12 **Press the Enter key, and then press the Previous or Next to display**

```
Boot System   Hard Disk
```

13 **Press the Enter key and the following displays:**

```
Boot System   Hard Disk 6
```

14 **Assume that hard disk 6 is the print system's internal hard disk. If you have any external hard disks connected, you can cycle through them by pressing the Next key. For this example we are using the internal hard disk. Press the Enter key. The system begins loading, and the following message displays:**

```
Boot System   booting   /
```

15 **At this point, DO NOT TOUCH ANY KEYS until the system has completed loading. The slash bar on the right end keeps rotating until the download is completed. As soon as downloading is done, the BootROM give the CPU to the downloaded image immediately. When the system rebooting and**

printer initialization is complete, the following message displays:

```
IDLE
```

» Note: If you do touch a key during this step, you must go back to step 10 and start from there again.

Installing From the Parallel Port

To install system software from the parallel port, follow these instructions:

1 Turn the printer off and back on again. The following message displays in the message window:

```
QMS Softload x.x    Ready to boot
```

2 Once this message displays, you have 10 seconds to press any key. Any key pressed during this period, aborts the auto boot process and accesses the BootROM User menu. The following message displays:

```
QMS Softload x.x    Boot System
```

» Note: If 10 seconds passes before you press any key, BootROM starts the auto boot and the

```
   Boot System x.x    loading    /
```

message displays. You must return to step 1. Also, if BootROM detects an error which trying to boot the print system, the BootROM User menu displays.

**3   After the BootROM User menu displays, press the Previous
     or Next key until the following message displays**

```
QMS Softload x.x   Install To Disk
```

**4   Press the Enter key to access the Install to Disk menu, and
     the following displays**

```
Install to Disk   Diskette
```

5   Press Next key until the following message displays:

```
Install To Disk   Parallel
```

6   Press the Enter key to display

```
Install To Disk   Target Disk 6
```

7   Press the Enter key. The following message displays:

```
Install To Disk   Connecting....
```

Disk 6 is the printer's internal hard disk.

**8   Go to your host system and run fstpio to send the file. When-
     ever the file is received, the following message displays:**

```
Install To Disk   AFILE.TXT   /
```

(*AFILE.TXT* is the current file name.) When all files have been
sent, the following displays:

```
Install To Disk   Complete
```

» Note: The operation is aborted whenever an error occurs, and the
  following displays

```
Install To Disk   E20 disk full
```

(E20 disk full is an error number.) See chapter 8, the "BootROM Error
Messages" section, later in this manual for the list of errors and their
recovery.

---

9 **You have now completed installing the system software and are ready to boot the system. Press the Back key. The message window displays the following message:**

```
QMS Softload x.x   Install To Disk
```

10 **Press the Previous or Next key until the message window displays:**

```
Boot System   Hard Disk
```

11 **Press the Enter key and the following displays:**

```
Boot System    Hard Disk 6
```

12 **Assume that hard disk 6 is the print system's internal hard disk. If you have any external hard disks connected, you can cycle through them by pressing the Next key. For this example we are using the internal hard disk. Press the Select key. The system begins loading, and the following message displays:**

```
Boot System   booting   /
```

13 **At this point, DO NOT TOUCH ANY KEYS until the system has completed loading. The slash bar on the right end keeps rotating until the download is completed. As soon as downloading is done, the BootROM gives the CPU to the downloaded image immediately. When the system rebooting and printer initialization is complete, the following message displays:**

```
IDLE
```

» Note: If you touch a key during this step, you must start over at step 9.

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2

Printer Configuration

In This Chapter . . .

- Configuring the printer
- Printer status page
- Using the control panel
- Printer configuration
- Configuration menus
- Changing default settings

Configuring the Printer

Configuring the QMS 4525 Print System involves setting default
printer options to meet your printing requirements. Examples of com-
mon configuration options are default page size, default number of
copies, and default font. You may find that many of the factory default
configuration settings suit your needs, but you may have to change
some of them. There are four ways to change printer configuration
options:

■ Printer control panel

■ Local and remote consoles

■ PS Executive Series Utilities

■ QMS Document Option Commands

Printer Control Panel

"Using the Control Panel," later in this chapter, describes the control
panel when the printer is on line and idle. "Printer Configuration" tells
you how to use the control panel to change the printer's default con-
figuration settings to meet your printing requirements. After you
become familiar with using the control panel, refer to chapters 3
through 10 and the advanced status page to determine the configura-
tion changes you want to make.

As with any network printer, one setting for any particular printer
option may not meet the needs of every user connected to the printer.
As you are configuring the printer, try to pick the setting that meets
the needs of most of the users.

Local and Remote Consoles

The QMS 4525 printer supports an optional local RS-232C console
that connects directly to a port on the printer, and 8 remote consoles
session via TCP/IP Telnet. Remote consoles behave similarly to the
local console (and control panel) as far as the information displayed
and available console commands are concerned.

When in normal mode with display message mode enabled, status
conditions that require user intervention display on a local or remote
console . The default to display status conditions on a local console is
normal mode, the default for a remote console is silent mode.
Reverse channel is seen in normal mode, and not in silent mode.

For example, status conditions may indicate that paper is low, output
bins are full, or a paper jam has occurred. Status conditions are redis-
played each time you press the Enter key to ensure that they do not
scroll off the screen. When the problem is cleared, the following mes-
sage displays:

```
Printer Ready
```

The console is a simple, line-oriented display of 24 lines of 80 charac-
ters. To list the available console commands, type ?↵ on the console
keyboard. If executing a console command results in more than a sin-
gle screen of output, the display pauses every 24 lines and waits for
you to press any key to continue.

Console Modes

Regular users and the system administrator use the console for differ-
ent purposes. Users check the status of their print jobs and cancel
jobs. They may also want to check available fonts or each language's
default configuration to ensure that it matches what their print jobs
expect. The system administrator uses the console more extensively
for printer configuration and file system management.

Thus, the console operates in two different modes, *user* and *admin*. In
the default user mode, only a subset of the console commands is
available. Only one console session may be in admin mode at a time.
The console prompt indicates if the console is in admin mode, user
mode, or if the system is off line.

You can use the local or remote console instead of the control panel
to change printer configuration settings. (See the *QMS Crown
Remote Console User's Guide*, for more information on remote con-
sole.

PS Executive Series Utilities

PS Executive Series Utilities, included with and designed specifically for your printer, provides another means of communicating with your printer. Features such as the following are provided only through the PS Executive Series Utilities:

■ Printer drivers, including a Windows 3.*x* driver

■ Screen fonts for Macintosh users

■ Screen printing for PC users

■ Printer naming

■ Font and directory listings

The PS Executive Series Utilities on-line help gives complete instructions for installing and using the software.

QMS Document Option Commands (DOC)

Printer configuration settings can be changed by appending QMS Document Option Commands (DOC) to the beginning of a print job. On some networks, you can set up print queues that automatically insert DOC commands that select specific printer features for print jobs sent via each queue.

For instance, you might set up a queue called "collate" which automatically sends DOC commands that cause the attached print job to be collated. Another queue, called "booklet," might print the attached job in booklet format with pages collated. After printing the job, the printer automatically reverts to its default configuration that was set via the control panel or a console. (See the *QMS Crown Document Option Commands* manual, for detailed information about QMS DOC commands.

Supported QMS DOC Commands

The following is a list of QMS Document Option Commands supported by the QMS 4525 printer (the optional emulations may not be on your printer). For a complete list of DOC commands and more

information on these commands, see the *QMS Crown Document
Option Commands* manual.

» Note: Updated Information on DOC commands that has not yet been
included in other manuals is included in appendix E, "Manual Updates," of
the System Administrator's Guide. These commands are prefixed with an
"*".

Command Summary

The following is a list of QMS Document Option Commands.

Header/Trailer

Function	Command
Print document creator	%%Creator:
Print creation date and time	%%CreationDate:
Print copyright statement	%%CopyRight:
Print current date	%%Date:
Print header page	%%IncludeFeature: header
Print document host	%%Host:
Print document owner	%%For:
Print document title	%%Title:
Print trailer page	%%IncludeFeature: trailer
Print routing information	%%Routing:
Print version and revision	%%Version:

Printer

Function	Command
Booklet printing	%%IncludeFeature: booklet
Collate document	%%IncludeFeature: collate
Duplex print	%%IncludeFeature: duplex
Logical margins	%%IncludeFeature: margins
Logical page orientation	%%IncludeFeature: pageorientation
Logical page size	%%IncludeFeature: pagesize
New layout	%%IncludeFeature: newlayout
Number up printing	%%IncludeFeature: pagegrid
Offset logical page	%%IncludeFeature: pageoffsets
Print background images	%%IncludeFeature: background
Print borders	%%IncludeFeature: border

Print page range	%%IncludeFeature: pagerange
Scale logical page	%%IncludeFeature: pagescaling
Select emulation	%%IncludeFeature: emulation
Select number of copies	%%IncludeFeature: numcopies
Select orientation	%%IncludeFeature: orientation
Select output bins	%%IncludeFeature: output
Select paper	%%IncludeFeature: input
Enable stapling	%%IncludeFeature: staple
Enable offset stacking	%%IncludeFeature: offset

HP-GL Emulation

Function	**Command**
Expand plot	%%IncludeFeature: expand
Scale the image	%%IncludeFeature: scaling
Select enhanced resolution	%%IncludeFeature: enhanced
Select original paper size	%%IncludeFeature: size
Select pen width and color	%%IncludeFeature: pen
Select plotter	%%IncludeFeature: plotter
Shift the origin	%%IncludeFeature: origin
Reverse image	%%IncludeFeature: reverse

HP PCL 5 Emulation

Function	**Command**
*Disable scalable	%%IncludeFeature: scalablefonts
*Install object	%%IncludeFeature: install
*Remove object	%%IncludeFeature: remove
*Remove resource	%%IncludeFeature: removeresource
*Select font	%%IncludeFeature: font
*Select font ID	%%IncludeFeature: fontid
	%%IncludeFeature: fontindex
*Select symbol set	%%IncludeFeature: symbolset
*Set carriage return	%%IncludeFeature: criscrlf
*Set line feed	%%IncludeFeature: lfiscrlf
*Set lines per page	%%IncludeFeature: linesperpage
*Set point size	%%IncludeFeature: pointsize
*Resource	%%IncludeFeature: resource
Reset to default	%%IncludeFeature: reset

Lineprinter Emulation

Function	Command
Font selection	%%IncludeFeature: font
Point size	%%IncludeFeature: pointsize
Character map	%%IncludeFeature: map
Line numbering	%%IncludeFeature: number
Tab spacing	%%IncludeFeature: tabs
Line feeds	%%IncludeFeature: lfiscrlf
Carriage returns	%%IncludeFeature: criscrlf
Form feeds	%%IncludeFeature: ffiscrff
Orientation	%%IncludeFeature: lporientation
Autowrap	%%IncludeFeature: autowrap
Lines per page	%%IncludeFeature: linesperpage
Margins	%%IncludeFeature: lpmargins

LN03 Plus Emulation

Function	Command
Include product identification	%%IncludeFeature: product
Move the X origin	%%IncludeFeature: xorigin
Move the Y origin	%%IncludeFeature: yorigin
Print Orientation	%%IncludeFeature: orient
Reset override to default	%%IncludeFeature: reset_override
Set default paper size	%%IncludeFeature: paper_size
Set paper size override	%%IncludeFeature: paper_size_override
Wrap long lines	%%IncludeFeature: autowrap

PostScript Emulation

Function	Command
Select PostScript level	%%IncludeFeature: languagelevel
Default dither	%%IncludeFeature: defaultdither

Session Commands

Function	Command
*Session	%%Session:
*Start New Layout	%%IncludeFeature: newlayout

Supported CCITT Group 3 and 4 Commands

Reverse bits	%%BitReverse
Set end of block	%%BlockEnd
Set data compression	%%Compression
Set dpi	%%DPI
Set encoded byte flag	%%EBA
Start decompression	%%ImageData
Set image position	%%ImagePosition
Set image size	%%ImageSize
Invert image	%%InvertImage
End print job	%%JobEnd
Set line end	%%LineEnd
Eject page	%%PageEnd
Set rotation	%%Rotation

Deciding Which Configuration Method to Use

Some configuration options can be changed only from the control panel menu system, some can be changed only from a local or remote console, some can be changed only with QMS DOC commands, and, of course, some options can be changed with any of these methods.

It makes no difference whether you change printer default configuration settings via the control panel or via a local or remote console, so use whichever method is most convenient for you. Just remember that the hierarchy of commands is usually:

■ Application

Selections (such as page size, orientation, duplexing, collating) you make when printing a file from your application override any network commands or printer configuration settings that do the same things. This gives you more control over your print job and your selections affect only that print job. Use your application to control your print job whenever possible.

■ Network Print Commands

Network print commands usually affect only an individual print job. However, when automatically sent from a print queue, network print commands are added to every job sent from that print queue. Network print commands may or may not override application commands, depending on the way the queue is set up. See your system administrator.

■ QMS DOC Commands

Selections (such as page size, orientation, duplexing, collating) you make by prepending QMS Document Option Commands (DOC) to the beginning of your print job, or that are automatically prepended to jobs sent from a network print queue, affect only that print job. This gives you control over your print job and your selections affect only that print job.

■ Control Panel

Changes made via the control panel affect the power-up default configuration of the printer, and therefore affect all subsequent print jobs unless overridden by your application or DOC commands. Printer default configuration settings should be set to support the most common requirements that are placed on the printer.

■ PS Executive Series Utilities

Changes made from PS Executive Series Utilities also affect the power-up default configuration of the printer, and therefore affect all subsequent print jobs unless overridden by your application or DOC commands.

■ Local or Remote Console

Changes made via local or remote consoles also affect the power-up default configuration of the printer, and therefore affect all subsequent print jobs unless overridden by your application or DOC commands.

Printer Status Page

Before you start configuring the printer, you should have a status page so you can see the current default settings of many of the printer configuration options.

Printing Status Pages

Printing a status page is a two-step procedure: Identify the type of status page to print and then print it.

Identifying Status Page Type

There are two types of status pages available:

■ **Standard**—This one page document lists printer identification information, current memory configuration, timeouts, communication settings, input buffer sizes, and available fonts.

■ **Advanced**—This document, which can be five or more pages, contains the same information as the standard status page as well as configuration menu settings, fonts, and downloaded emulations.

Printing a Status Page

After you have identified the type of status page to print, select that status page type in the Administration / Special Pages / Status Page Type menu. Then you can send the status page to print. Make sure the printer is on line and idle, and press the Status Page key.

Using the Control Panel

The QMS 4525 Print System provides a full-featured control panel that makes it easy to configure and control the printer. The printer also uses the control panel to communicate with you by providing messages about its status, including any conditions that require your attention. These messages can be displayed in English, French, or

German. The control panel layout is uncluttered, and the keys are large and clearly marked.

When the printer is on line and idle (ready to accept a print job), this is what the control panel looks like
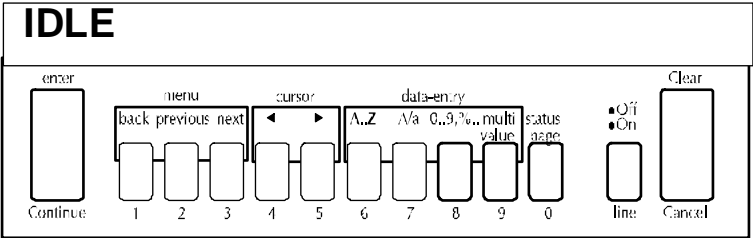
Many of the control panel keys have different functions when the printer is off line and when it is on line. For descriptions of the keys when the printer is off line, see "Printer Configuration" later in this chapter.

Control Panel Keys

These are the keys that are functional when the printer is on line:

Symbol	Key Name	Function
	Continue	Continues the current print job after a paper jam or engine error is cleared.
	Status Page	Prints a status page which shows the printer's current status and configuration, including available paper sizes and installed fonts.

	Line	Toggles the printer between on line and off line. The two lights above the key indicate the current status.
●Off ●On [line]		
[Clear] [Cancel]	Cancel	Cancels all jobs that are currently being processed or printed, or sends an end-of-job indicator to a print job waiting for incoming data. Print jobs that are spooled begin printing after current jobs are cancelled or ended.

Message Display
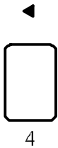
The control panel message display is a single-line display with two fields. When you are using the control panel to change printer config-uration settings, a menu name or option name displays in the first field and a menu or option name or option setting displays in the second field. Printer status messages and error messages are also displayed.

Printer Configuration

To configure the printer via the control panel, place it off line by press-ing the Line key. The On indicator above the key goes out and the Off

indicator lights, indicating that the printer is off line. When the printer
is off line, these keys are functional:

Symbol	Key Name	Function
enter / Continue	Enter	Works as an Enter key when selecting configuration options or when you are entering data in the configuration menus. If a menu displays, pressing this key enters that menu.
Clear / Cancel	Clear	Clears input data from the display at the current cursor position.
back / 1	Back	Enters the Configuration menu. In other menus, this key goes back to the previous menu.
previous / 2	Previous	Moves to the previous option in the current menu. When you are entering data, this key also cycles to the previous ordinal character.

Symbol	Key Name	Function
next 3	Next	Moves to the next option in the current menu. When you are entering data, this key also cycles forward to the next ordinal character.
◄ 4	Left	Moves the cursor left one character position. Use this key and the Right key when entering a string in response to a configuration question.
► 5	Right	Moves the cursor right one character position. Use this key and the Left key when entering a string in response to a configuration question.
A..Z 6	A..Z	Cycles through the characters A to Z when you are entering data.

Symbol	Key Name	Function
A/a 7	A/a	Toggles between uppercase and lowercase letters.
0..9,%.. 8	0..9,..	Cycles through numeric values 0 - 9, followed by punctuation keys and symbols (for example, !, @, #, $), when you are entering data.
multi value 9	Multi Value	Intended to be used only by the QMS Service Engineer and is not described in this manual.
●Off ●On line	Line	Exits from the Configuration menu and toggles the printer between off line and on line.

Configuration Menu

The printer's configuration menu options are divided into two main menus: Operator Control and Administration.

■ **Operator Control menu**

The Operator Control menu configures the number of copies, inputbins, outputbins, chain inputbins, duplex, tumble duplex, collation, page orientation, job accounting settings.

■ **Administration menu**

The Administration menu controls default configuration options through the Communications, Emulations, Special Pages, Startup Options, Memory, Engine Setup, Miscellaneous, and Disk Operations menus.

Accessing the Configuration Menu System

Once the printer is off line, press the Back key to enter the Configuration menu.

The configuration menu displays as two fields of text on the control panel. The first field (left) shows the current menu (Configuration in this case) and the second field (right) shows the Operator Control menu. Here's how the control panel looks at this point.
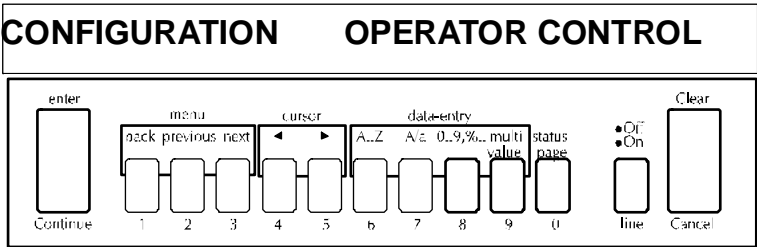
Accessing the Operator Control Menu

If you want to change option settings in the Operator Control menu, press the Enter key to access the menu. The menu name and the first option in the menu are displayed:

```
OPERATOR CONTROL     COPIES
```

To access a menu or option in the Operator Control menu, use the Next and Previous keys to display it in the second field and press the Enter key. If the selected item is another menu, the menu name and the first option in that menu display. If the selected item is a configuration option, the option displays in the first field and a list of possible settings displays in the second field. If the option requires you to enter text (operator password, for instance) the current text is displayed in the second field with the first character underlined. Use the A..Z key to cycle through the alphabet and the Left/Right keys to move between characters in the text.

Accessing the Administration Menu

If you want to change option settings in the Administration menu (starting at the point shown in control panel illustration above), press the Next key to advance to the Administration menu, and press the Enter key to access it. The menu name and the first option in the menu are displayed:

```
ADMINISTRATION       COMMUNICATIONS
```

To access a menu or option in the Administration menu, use the Next and Previous keys to display it in the second field and press the Enter key. If the selected item is another menu, the menu name and the first option in that menu display. If the selected item is a configuration option, the option displays in the first field and a list of possible settings displays in the second field. If the option requires you to enter text (printer name, for instance) the current text is displayed in the second field with the first character underlined. Use the A..Z key to cycle through the alphabet and the Left/Right keys to move between characters in the text.

Changing Default Settings

There are two types of printer menu options: those that require choosing from a set of possible pre-defined values and those that require entering alphanumeric information.

An Enumerated List of Values

If an option has an enumerated list of possible values, they display in the second field of the message window. Here we use the Administration / Communications / Serial / Baud Rate option as an example of choosing values from an enumerated list:

1 With the printer idle, press the Line key to place the printer off line.

2 Press the Back key to enter the Configuration menu:

```
CONFIGURATION          OPERATOR CONTROL
```

3 Press the Next to advance to the Administration menu:

```
CONFIGURATION          ADMINISTRATION
```

4 Press the Enter key to enter the Administration menu:

```
ADMINISTRATION         COMMUNICATIONS
```

5 Press the Enter key to enter the Communications menu:

```
COMMUNICATIONS         TIMEOUTS
```

6 Press the Next key until the Serial menu displays in the second field:

```
COMMUNICATIONS         SERIAL
```

7 Press the Enter key to enter the Serial menu:

```
SERIAL                 MODE
```

8 Press the Next key until the Baud Rate menu displays in the second field of the message display:

```
SERIAL                 BAUD RATE
```

9 **Press the Enter key to enter the Baud Rate menu. The first
choice in the set of baud rate values displays in the second
field. This value is also the current default setting.**

```
BAUD RATE          9600
```

**10 Press the Next key until the value you want (for example,
2400) displays:**

```
BAUD RATE          2400
```

**11 Press the Enter key. A confirmation message displays for a
few seconds:**

```
BAUD RATE CHANGED  2400
```

12 Then, the option's name displays:

```
SERIAL             BAUD RATE
```

You have now changed the baud rate to 2400. The change does not
take effect until you place the printer on line. Before doing so, review
the "Saving Printer Configuration Changes" section, later in this chapter.

Alphanumeric Strings

If an option is an alphanumeric string, you enter the string one character at a time. You use the 0..9,%..key to cycle through the numbers,
and the A..Z key to cycle through the characters. Use the A/a key to
change the case of characters entered with the A..Z key.

» Note: The following characters appear as blocks on the control panel and the console when you enter or change non-alpha characters using the 0..9,%.. key. The QMS 4525 Print System shows the following non-supported characters as blocks.

Use the previous and next characters shown in the next paragraph to determine what character the block represents:

Block-represented Character	Previous Character	Next Character
space	z	0
$	#	%
^	]	-
-	^	'
~	}	A

Alphanumeric String Example

The Copies option in the Operator Control menu is an example of an alphanumeric string. The following instructions show how to change an alphanumeric string:

1   **With the printer idle, press the Line key to place the printer off line.**

2   **Press the Back key. The following message displays in the message display:**

```
CONFIGURATION          OPERATOR CONTROL
```

3   **Press the Enter key. This opens the Operator Control menu, which displays in the first field of the message display:**

```
OPERATOR CONTROL       COPIES
```

4   **Press the Enter key again to display the current setting (the default copy count is 1):**

```
COPIES                 001
```

5   **Notice that the first digit is highlighted. You may select any
     number of copies up to 1000. For this example, we are set-
     ting the copy count to 159.**

6   **Press the Next key once. The first digit changes from 0 to 1.
     Press the Enter key.**

7   **The second digit is now highlighted. Press the Next key until
     the second digit changes to 5. Press the Enter key.**

8   **The third digit is now highlighted. Press the Previous key
     until the last digit changes from 1 to 9:**

     ```
     COPIES              159
     ```

9   **Press the Enter key. The message display momentarily con-
     firms the change you have made:**

     ```
     COPIES CHANGED TO 159
     ```

     Then the message display displays the option's name again.

     ```
     OPERATOR CONTROL   COPIES
     ```

You have now changed the copy count to 159 copies per print job.
The change does not take effect until you place the printer on line.
Before doing so, review the next section, "Saving Printer Configura-
tion Changes."

Saving Configuration Changes

Before the printer can accept print jobs with configuration changes,
the changes must be saved.

Example

To save configuration changes, press the control panel keys in the
order shown in the following example. The printer responds by dis-
playing a message in the message window.

Whenever you make a change to most printer menu options, the
printer prompts you to save the change when you place the printer on

line. Saving a menu change means that the new value of the option is recorded and stored in the printer's memory. Follow these steps to save your change to the Baud Rates and Copies options:

1   Press the Line key or the Back key to exit from the menu and be prompted to save your change (Line key) or return to the previous menu (Back key). The following message displays:

```
SAVE CHANGES?        NO
```

2   Press the Next key to advance to the Save Changes/Yes option. (`YES` displays in the second field), and then press the Enter key. The printer saves your changes and returns to idle.

3   Press the Line key turn on the On indicator and enable the printer to accept and print new jobs.

»   Note: Some Administration menu changes require that the printer be restarted before they take effect. Some changes restart the printer automatically while others display the message REBOOT NOW? in the control panel message window. If this message appears, select YES to restart the printer and have the changes take effect immediately, or select NO to wait until you manually restart the printer before the changes take effect.

❖

3

Operator Control and Installation Menus

In This Chapter . . .

- Copies
- Duplex and tumble duplex
- Collation
- Orientation
- Input bins, output bins, chain input bins
- Accounting
- Password protection

The Operator Control Menu

The Operator Control menu has options that set the default values of the various paper handling features of the QMS 4525 Print System. The default values set through this menu are used in the absence of an emulation (such as application or printer language) or DOC command setting (which also includes network print commands). The Operator Control menu may be password-protected (see "Installation Menu" later in this chapter for more information about passwords).

Operator Control Menu

Copies
Duplex
Tumble Duplex
Collation
Orientation
Inputbin
Outputbin
Chain Inputbins
Accounting

Copies

The Copies option specifies the number of copies to be printed. The factory default setting is 1. The maximum setting is 1000.

The best way to specify the number of copies you want to print is through your application. In that case, keep the printer's Copies option set to 1. Then, the number of copies selected in your application determines the number of copies printed. If you want multiple copies collated, set the Collation option to On (see the "Collation" section later in this chapter).

Duplex

The Duplex option enables printing on both sides of a sheet. The default setting is Off. Unless you want all jobs printed in duplex mode, do not change the default setting. The best way to specify duplex printing is through your application. In that case, use it to turn duplex mode On and Off, and leave this option set to Off.

The illustration below shows the duplex and tumble duplex options.

Tumble Duplex

The Tumble Duplex option controls the default settings for duplex mode. When using tumble duplex, both the Duplex and Tumble Duplex options must be On. The default setting is Off. The illustration below shows the difference between duplex and tumble duplex.

Side 1   Side 2   Side 1   Side 2

Portrait   Landscape

DUPLEX

Side 1   Side 2   Side 1   Side 2

Portrait   Landscape
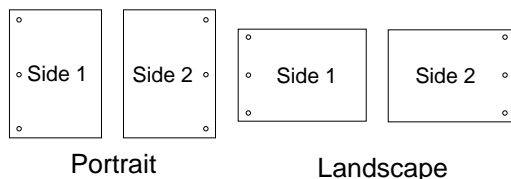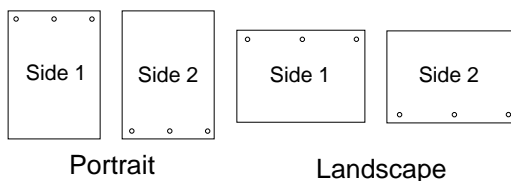
TUMBLE DUPLEX

Collation

The Collation option enables or disables collated stacking of multiple copies in the output bins. The default setting is On. The illustration below shows the difference between collation on and collation off. See appendix E, "Manual Updates," for more information on collation.

Collated　　　　　　　　　　**Uncollated**
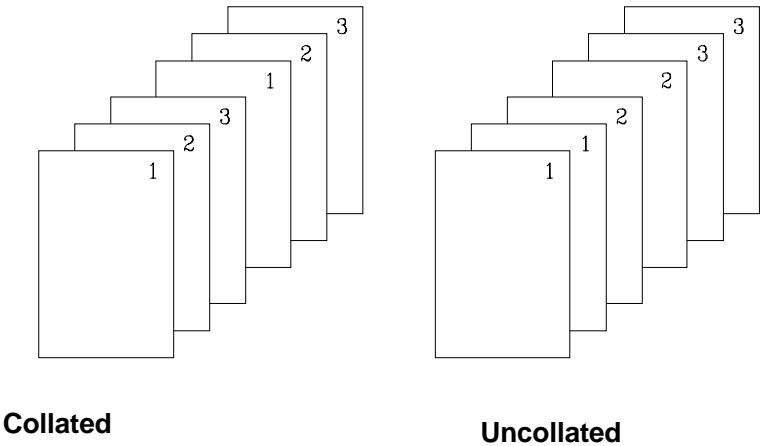
Orientation

The Orientation option selects portrait or landscape orientation of the image on the physical page. The default setting is Portrait.

The best way to specify orientation is through your application. If you use your application's page orientation feature, set this option to Portrait.

» Note: The only way to set lineprinter orientation is via the Lineprinter
Orientation option on the Administration / Emulations / Lineprinter menu or
via the LPOrientation DOC command available in the Lineprinter emulation.
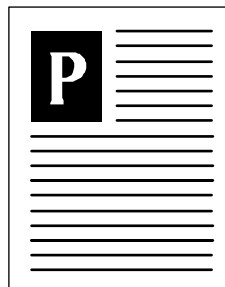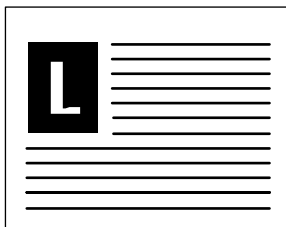
Inputbin

The Inputbin option selects the Upper or Lower input bin as the default input bin. The illustration below shows the locations of the input bins. The default setting is lower.
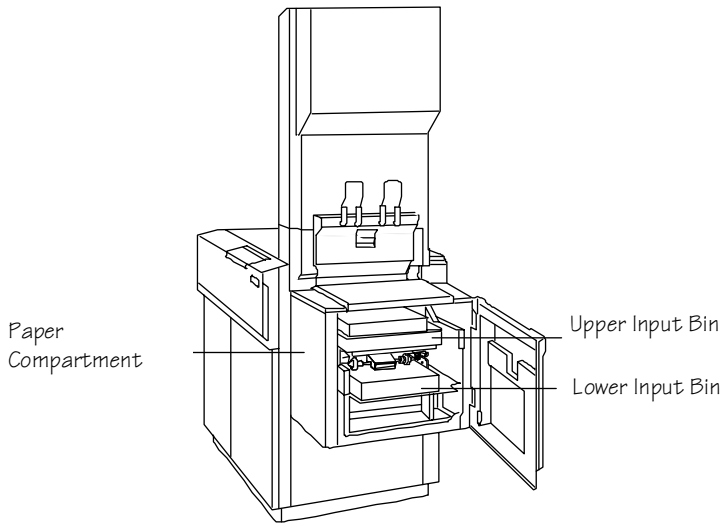
Print Media Sizes and Imageable Areas

Your printer supports paper and transparencies in eight sizes. Each size has a certain imageable area, the maximum area capable of being printed on. It is subject to both hardware limits (the physical page size and the margins required by the printer engine).

The following are the supported paper types and their imageable areas:

Paper type	Inches		Millimeters	
	Page Size	Imageable Area	Page Size	Imageable Area
Letter	8.5 x 11.0	8.19 x 10.66	216 x 279	208 x 271
Legal large	8.5 x 14.0	8.19 x 13.69	216 x 356	208 x 348
A4	8.3 x 11.7	7.95 x 11.37	210 x 297	202 x 289
Quarto	8.0 x 10.0	7.67 x 9.68	203 x 254	195 x 246
Commercial	8.3 x 10.6	7.95 x 10 .31	210 x 270	202 x 262
Foolscap	8.0 x 13.0	7.67 x 12.67	203 x 330	195 x 322
Folio	8.3 x 13.0	7.95 x 12.67	210 x 330	202 x 322
Legal Small	8.5 x 13.0	8.19 x 12.67	216 x 330	208 x 322

» Note: If a requested paper size is not installed in the printer, you are prompted to install the correct paper.

Page Policy

The following QMS 4525 Print System page policy specifies the action that is to be taken when a print job requests a paper size. Each page of the print job is to be printed from a selected input bin on a selected paper size. Your printer is capable of recognizing only two different paper sizes for any configuration.

Config	Present	Chain	Policy
no	x	no	Print on whatever paper is in the desired bin. If no paper is in the desired bin, stop and prompt the user to load any paper in the desired bin.
no	x	yes	Print from the desired bin if it has paper. Otherwise, print from the other bin if it has paper. If both bins are empty, stop and prompt the user to load any paper in any bin.
yes	no	no	Stop and prompt you to load the desired paper in the desired bin.
yes	no	yes	Print from the other bin if the desired paper is loaded. Otherwise, stop and prompt the user to load the desired paper in any bin.
yes	yes	x	Print on the desired paper from the desired bin.

    *config   = engine configured for desired paper size
    *present = desired paper size is present in desired bin
    *chain   = input bin chaining enabled
     x   = not applicable

Outputbin

The Outputbin option selects, as the default output bin, the Side output bin, one of the sorter bins if you have a sorter, or the stacker tray if you have a stacker/stapler. The default out pubin is output bin 1.The

illustration below shows the locations of the output bins on a 20-bin sorter.

Sorter Output Bins

Side Output Bin
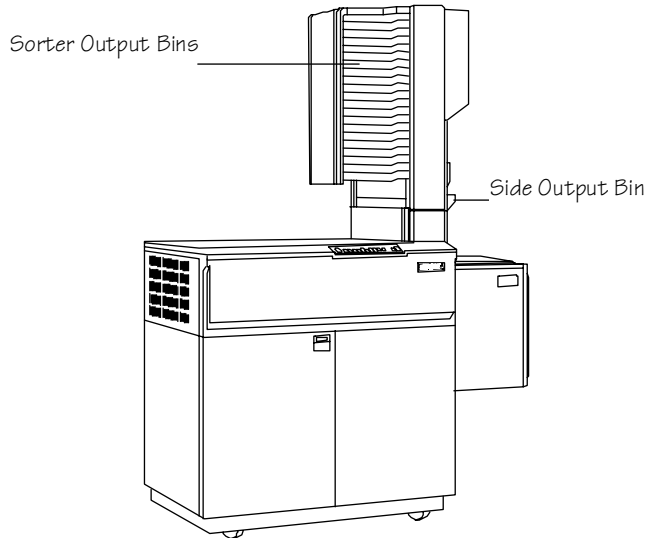
Chain Inputbins

The Chain Inputbins option specifies whether or not the printer switches to the other inputbin (if it contains the same size paper) when the current inputbin is empty. The default setting for Chain Inputbin is Off.

Accounting

The following three types of accounting are available with your QMS 4525 Print System:

■ **Crown Accounting**

If your printer is connected to a host, standard QMS Crown accounting is available to you on the QMS 4525 Print System.

■ **Standard Network Management Systems (SNMP)**

If your printer is connected to a network via TCP/IP, you have standard QMS Crown accounting and SNMP accounting (the standard system for managing the network provides). See the *TCP/IP Protocol Option User's Guide*, for more information on SNMP.

■ **TCP/IP Accounting/Reverse Channel**

If your QMS 4525 is connected to a network with a TCP/IP interface, you have standard QMS Crown accounting, SNMP accounting, and TCP/IP Accounting and Reverse Channel. See the *TCP/IP Protocol Option User's Guide*, for more information on TCP/IP accounting.

Crown Accounting

Crown accounting is a tool to help you keep track of resource utilization for the QMS 4525. Typically, the number of sheets of each paper type supported is the most common resource for which Crown printer accounting is kept. The system administrator is interested in knowing the paper utilization per user, the time consumed servicing the print jobs per user, connectivity options, frequency of jams, times of peak usage, number, complexity, and size of jobs per user, and features and options most commonly used (duplexing, finishing, and other options).

Accounting Menu

The Accounting menu is under the Operator Control Menu. This menu enables or disables job accounting, allocates disk space when accounting is enabled, resets accounting, lets you store job accounting information in a single job file or in multiple files, and copies the accounting information to floppy disk.

Job accounting information can be stored in a single file if it can be retrieved using the file transfer protocol (ftp) on your host. Otherwise, the selected job accounting file size should be spread into several files so that each of the files (or segments) fits on a floppy disk.

Operator Control / Accounting Menu

Accounting Mode
File Size
Reset Accounting
File Segmentation
Copy to Floppy

» Note: To facilitate operation of the Accounting options it is highly recommended that you use a local console. A vt-100 terminal connected directly to the console port on the printer interface panel using a serial RS-232C connector.

Accounting Mode

The Accounting Mode option enables or disables job accounting. The range is On or Off. The default value is Off. When you disable accounting and the accounting file(s) is (are) not empty, they remain untouched. However, if they are empty, they are removed to save disk space.

File Size

The File Size option allocates disk space for the Job Accounting file(s). The range of values is 50 KB to 10 MB. The default value is 1 MB. If the selected value is greater than the current value, the file size is increased to reserve the extra space. If the value is smaller than the current file size, any unnecessary (still empty) Job Accounting files

are removed. If only one file is used and it is not empty, it cannot be shrunk.

If no accounting information exists in the system when shrinking the usage, the Job Accounting file(s) is (are) recreated using the new size. The printer does not ask for confirmation for this operation. It takes effect immediately.

The amount of space required for each job can vary between 200 and 250 bytes so you can store information for 4000 to 5000 jobs for each 1 MB in the Job Accounting file.

Reset Accounting

The Reset Accounting option erases the Accounting files and re-creates them using the current file size. If this operation is selected when Accounting is disabled, the files are removed but not recreated, thus saving disk space. The range of values is Yes or No. The default value is No.

This operation is also available as the **resetaccount** command for the admin user in the local or remote consoles. See the *Remote Console User's Guide*, for more information on the **resetaccount** command.

Whenever the job file(s) are more than 80% full, the following message is displayed on the control panel, local, and remote consoles

```
xxxxxxxx FILE xxx% FULL
```

($xxx\%$ represents the percentage full in increments of 5%–85%, 90%, and 95%.) This is an appropriate time to copy these files to floppies or to transfer them to your host computer using ftp if it is available to you. Then use the option to reset the accounting files to empty after they are copied to a floppy or to a host.

When the file is 100% full, the

```
xxx FILE IS FULL
```

message displays.

» Note: When accounting is enabled and the Job Accounting file(s) is (are) 100% full, no further print jobs will be accepted by the printer until Reset Accounting is selected or until Accounting is disabled. If you disable Accounting at this time, no job information will be stored from that point on. You can retrieve your accounting files while they are full and then do the Reset Accounting operation. However to avoid delaying jobs being sent to the printer, it is advisable to perform the retrieve/reset operations before the Job Accounting files fill up.

File Segmentation

This is used to indicate to the system whether to store the accounting information in a single file or in multiple files. If a single file is used, its size will be equal to the File Size value described earlier in this section. The file name will be ACC1.JOB.

If multiple files are selected, their combined size will be equal to the File Size value described earlier in this section. Each file will be 1 MB, with the exception of the last file. The Job file names will be ACC1.JOB, ACC2.JOB, and so on.

Copy to Floppy

This option copies each of the Accounting files to the floppy. Make sure that the floppy disk you use is formatted for DOS compatibility. The last selection copies the auxiliary accounting files to the floppy disk. These files are ACC.STA, ACC.PAP, ACC.DIC. These files are described later in this chapter. Additionally, there is an entry for each of the possible Job Accounting files (ACC1.JOB through ACC10.JOB). Not all will exist, so you need to copy only the ones that are necessary. For example, if you choose a single file, only ACC1.JOB will need to be copied. If multiple files are used, the size chosen will determine which Accounting Job files need to be copied. For example, if the size is 7.5 MB, then you will need to copy files ACC1.JOB through ACC8.JOB. If you attempt to copy a non existent file, a `FILE NOT FOUND` error displays.

How Crown Accounting Works

As jobs are printed on the QMS 4525 printer, the system collects information about different job parameters in relation to the jobs. When each job completes, the printer stores an entry for the job in the Job Accounting file(s).

⌦ **Caution:** Do not turn the printer off while the disk is being accessed. Doing so may cause inconsistencies in the information stored.

The following accounting files are stored in the path DSK6:/admin:

■ Job Accounting File (ACCx.JOB)

This is the main accounting file (it may be a single or multiple files). When each job completes, the printer stores an entry for the job in this file. (*x* is the number of the Job Accounting file when multiple files are used.) Information in this file is kept intact after the printer is turned off and back on again.

■ Paper Accounting File (ACC.PAP)

This file contains descriptions of the paper types supported on the QMS 4525 Print System.

■ Status Accounting File (ACC.STA)

This file stores configuration information about accounting.

■ Dictionary File (ACC.DIC)

This file contains documentation about accounting and a description of the fields used in the other accounting files.

⌦ **Caution:** All the accounting files are stored in ASCII format to make it simpler to use the information in different environments after it is retrieved from the printer's hard disk.

Accounting File Format Description

The ASCII file format chosen allows the file to be extended by tagging each field in each record in each of the accounting files. New fields can be added by creating new tag identifiers for the new fields.

This allows backward compatibility for existing filters when the accounting files evolve in future versions. A version field is included to identify the supported fields as the system evolves.

The following format is the same for the three file types:

■ Tag Identifiers

In order to minimize disk space, the tag identifiers are three digit numbers instead of names. The Dictionary file provides the field names associated with each tag identifier.

■ String Information

String information is stored inside braces (for example, {this is a string}). This allows spaces within strings and stores only the necessary characters of a string value. String fields for which no value is specified are stored as {}, instead of using blanks or the maximum field size.

■ New Records

New records are separated by a <CR> character. This separator increases the file readability.

■ Separators

A typical record in any of the accounting files is a sequence of pairs of tag identifiers and field values separated by commas. The tag identifier and field value are separated by a colon.

The following is an example of the format of an accounting file record:

```
 1: 3, 2:{this is a string},  <CR>
```

In this example, the record has fields identified by tags 1 and 2. Notice that since these values don't make use of the 3 digits for the tag identifier, spaces are stored instead. (This is for consistency and

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simplicity at the expense of using a small amount of extra space.) In this example, the value for the field tagged 1 is the integer 3 and the value for the field tagged 2 is a string. The <CR> represents the carriage return character.

Accounting Files Description of Fields

This section briefly describes the meaning and provides the ID and name for each of the fields and each of the accounting files.

Job Accounting File Record Description

Field ID 0:	The Job ID field is the sequential number of the document since the last time the printer was turned of and back on again.
Field ID 1:	This field is the priority of a document which is internally assigned.
Field IDs 2 and 3:	These fields are the time and date of document arrival in the printer.
Field ID 4:	This field is the completion code of the document. The completion code represents the following possible values: 0 User-aborted document 1 Printer (not the emulation) aborted the document 2 Emulation aborted the document 3 Successfully printed document
Field ID 5:	The User Name field corresponds to the PS %%**For** DOC.
Field ID 6:	The Host Name field corresponds to the PS **%%Host** DOC.
Field ID 7:	The File Name field corresponds to the PS **%%Title** DOC.
Field ID 8:	The Charge Number field corresponds to the DOC. This field identifies the account.
Field ID 9:	The Compile Time field represents the processor time spent translating the page description language, and it typically also includes minimal other system activity. The time is given in milliseconds.
Field ID 10	The Print Time field represents the total elapsed time (milliseconds) used by the document since its first page started printing until its last page cleared the printer.
Field ID 11:	The Header Count field indicates how many images comprise the document header page(s) subjob.
Field ID 12:	The Error Count field indicates how many images comprise the document error page(s) subjob.

Field ID 13:	The Body Count field represents the number of images in the actual document excluding multiple copies.
Field ID 14:	The Simplex Count field represents the sheet count of simplex pages printed, taking into consideration multiple copies.
Field ID 15:	The Duplex Count field represents the sheet count of duplex pages printed, taking into consideration multiple copies.
Field ID 16:	The Finishing Options field is a number formed by adding the codes for the different options: 1 Stapling 2 Offset Stacking 4 Folding » Note: All options are not available in all printers. See your printer's user's guide for the options available for your printer.
Field ID 17:	The Chunk Count field represents the number of times partial collation was done because of the large size of the document when printing multiple copies or printing in descending order. If the complete document does not fit in memory, chunk collation is activated. A value of 1 for this field indicates no partial collation was necessary.
Field ID 18:	The Jam field indicates how many times the printer jammed while printing the document.
Field ID 19:	The Paper Types Count field indicates how many different types of papers were used in the document and represents the number of separate index entries that follow the main record for the document in the Job Accounting file. A <CR> follows this field before the index entries.

Field ID 20:	The Index Count field represents the number of sheets of paper of a specific type used by the document. The actual description of the paper is in the Paper Accounting file.
Field ID 21:	The Index field represents the record number in the Paper Accounting file that contains the description for the preceeding paper count. A <CR> follows each occurrence of this field.

Job Accounting File Record Example

The following example is a sample record extracted from an actual Job Accounting file:

```
0:  2868,  1: 1,  2:{ 4h13m50},  3:{ 1/ 10/94},  4:3,  5:{},  6:{},
45:{Parallel}, 7:{}, 8:{}, 9:    859, 10:    3220, 11:  0, 12:  0, 13:
1, 14:    1, 15:  0, 16:0, 17:  1, 18:  0, 19:  1, 20:      1, 21:    3,
```

Paper Accounting File Record Description

Field ID 22:	The Paper Width field contains the paper width which is measured in thousands of an inch (mils) and represents the horizontal dimensions of the paper.
Field ID 23:	The Paper Height field contains the paper height which is measured in thousands of an inch (mils) and represents the vertical dimensions of the paper.
Field ID 24:	The Paper Weight represents the weight per surface square units.
Field ID 25:	The Color field indicates the color of the paper type.
Field ID 26:	The Type field indicates additional properties of the paper.
Field ID 27:	The Label field represents a name for the paper type.

Paper Accounting File Record Example

The following example is a depiction of the current QMS 4525 Paper Accounting file:

```
22:  8000, 23: 10000, 24:  75, 25:{          white}, 26:{
plain}, 27:{          },
22:  8270, 23:  10630, 24:  75,  25:{     white}, 26:{
plain}, 27:{          },
 22: 8500, 23: 11000, 24:  75, 25:{           white}, 26:{
plain}, 27:{          },
 22: 8270, 23: 11690, 24:  75, 25:{           white}, 26:{
plain}, 27:{          },
 22: 8000, 23: 13000, 24:  75, 25:{           white}, 26:{
plain}, 27:{          },
 22: 8270, 23: 13000, 24:  75, 25:{           white}, 26:{
plain}, 27:{          },
 22: 8500, 23: 13000, 24:  75, 25:{           white}, 26:{
plain}, 27:{          },
 22: 8500, 23: 14000, 24:  75, 25:{           white}, 26:{
plain}, 27:{          },
```

Status Accounting File Record Description

Field ID 28:	The Version field indicates the accounting files' version number. This initial revision will be version 1.
Field ID 29:	The Number of Paper Types field indicates the corresponding number of records in the Paper Accounting file.
Field ID 30:	The Job Accounting File Size field indicates the configured maximum total sizes of all the job files used (this is user configurable).
Field ID 31:	The Last Job File Size field indicates the last job file size (which can be less than 1 MB different).
Field ID 32:	The Job File Usage field indicates the total current level of use in all the job files.
Field ID 33:	The Current Job File Usage field indicates the level of use in the current Job Accounting file.
Field ID 34:	The Maximum Number of Job Files field indicates the maximum number of job files used.
Field ID 35:	The Current Job File field indicates the last Job Accounting file to use.
Field ID 36:	The Number of Jobs field indicates how many documents are accounted for in the Job Accounting file(s).
Field ID 37:	The Multifile field has a value of 1 if a single file is used and a value of 2 if multiple files are used to store job information.
Field ID 38:	The Enabled field indicates whether accounting is enabled or disabled. 1 Enabled 2 Disabled

Field ID 39:	The Job File Full flag indicates whether the Job Accounting file is full.

	1	Indicates that the file is full and that Resetaccounting should be performed.
	2	Indicates that the file is note full.

Field ID 40:	The Paper Accounting File Full flag indicates whether the Paper Accounting file is full.

	1	Indicates that the Paper Accounting file is full andthe Resetaccounting should be performed.
	2	Indicates that the Paper Accounting file is not full.

Field ID 41:	The User field indicates the maximum length of the User Name field in the Job Accounting file.
Field ID 42:	The Host field indicates the maximum length of the Host Name field in the Job Accounting file.
Field ID 43:	The File field indicates the maximum length of the File Name field in the Job Accounting file.
Field ID 44:	The Charge field indicates the maximum length of the Charge Number field in the Job Accounting file.
Field ID 45:	The Connection field indicates the I/O port in which the job arrived. (This is an extension to the initial Job Accounting file record.)

Status Accounting File Record Example

The following is an example of the Status Accounting file:

```
28: 1, 29:   8, 30:  51200, 31:  51200, 32:     0, 33:     0, 34: 1,
35: 1, 36:    0, 37:2, 38:1, 39:0, 40:0, 41:31, 42:23, 43:31, 44:31,
```

Copying the Accounting Files

Copy the accounting information in one of the following ways.

» Note: The printer must be off line when any of the operations discussed in this section are performed. Use the ls command in the DSK6:/admin directory to see which accounting files you are going to retrieve. The ls and cp commands are issued from within a local or remote console.

■ Using the Copy to Floppy Accounting Menu Option

Copy each of the accounting files from the printer's hard disk to floppy disk and then copy from the floppy disk to the host computer.

■ Using the **cp** Command

Copy from the printer's hard disk to a floppy disk and then copy from the floppy disk to the host computer.

■ Using the File Transfer Protocol (ftp)

Use ftp from the host computer (if a TCP/IP connection is available to the printer) to download the information from the printer to the host.

Using the cp Command

Use the **cp** command to download accounting information from the printer's hard disk to a floppy disk as follows:

1 Use a local or remote console, put the printer off line, enter the Administration menu, and issue the cp command.

2 Insert a DOS-formatted floppy disk into the floppy disk drive.

3 Download the accounting information to the floppy disk using the following commands:

» Note: The device names (DSK6 or FLPO) must be uppercase. The filenames can be either uppercase or lowercase. If multiple Job Accounting files are used, each of the ACCx.JOB files should be retrieved. (x is the number of each subsequent Job Accounting file.)

```
cp DSK6:/admin/acc1.job FLP0:/acc1.job↵
cp DSK6:/admin/acc.pap FLP0:/acc.pap↵
cp DSK6:/admin/acc.sta FLP0:/acc.sta↵
cp DSK6:/admin/acc.dic FLP0:/acc.dic↵
```

Using the File Transfer Protocol

» Note: File transfer protocol only works when the printer is in an IDLE state. If multiple Job Accounting files are used, each of the accx.job files should be copied. (x is the number of each subsequent Job Accounting file.)

Use the file transfer protocol on the host to copy the files from the printer's hard disk to the host as follows:

1 Type **ftp** *printer-name* (where *printer-name* is either the Ethernet address of the printer or its corresponding Ethernet name).

2 When prompted for a user id, enter **admin** as user name and give the appropriate password, if required.

3 When in the ftp utility, type **bin** at the ftp prompt to download the files in binary mode.

4 Type **get** *filename* (where *filename* is the name of the accounting file)

```
DSK6:/admin/acc1.job acc.job1
DSK6:/admin/acc.pap acc.pap
DSK6:/admin/acc.sta acc.sta
```

5 Repeat this step for each accounting file being copied. Specify the full path name of the files being copied including the device name.

Processing Accounting Information on the Host

After the accounting files are stored on your host, you can create your
own filters (programs) based on your specific requirements using the
file and record descriptions shown earlier in this chapter.

The Installation Menu

The Installation menu can be used to password-protect the Operator
Control and Administration menus. It also protects and authorizes you
to open a remote console session (if available on your system) and
access the admin mode. This menu appears when the password disk,
described later in this document, is inserted in the floppy disk drive.

» Note: When using the File Transfer Protocol (ftp), the ftp admin logon is
password-protected by the password set using the Admin Passwrd option
when the Use Admin Pwd option is set to On. The ftp logon with other names
is password-protected by the PASSWRD.FTP file if this file exists.

Operator Control / Installation Menu

Operator Passwrd
Use Operator Pwd
Admin Password
Use Admin Pwd

Operator Passwrd

This option maintains the Operator Control menu password. The
password may be up to 16 characters (any letter, number, or symbol)
in length. It is case sensitive and is entered like an alphanumeric
string. If you choose a password that is not 16 characters long, press
the Select key until you get to the left-most character of the password
field.

Enter this character string the same as you would enter an alphanu-
meric string, see chapter 2, "Entering Alphanumeric Strings," for more

information on how to enter the string. If you enter an invalid pass-
word, a message indicating that the password is invalid displays.

Use Operator Pwd

This option sets the Use Operator Pwd value. The range is On and
Off. If this value is set to On, access the Operator Control menu
requires a password. If this value is set to Off, a password is not
required to access the menu. The default value is Off.

Admin Passwrd

This option maintains the Administration menu's password. The pass-
word may be up to 16 characters (any letter, number, or symbol) in
length. It is case sensitive and is entered like an alphanumeric string.
If you choose a password that is not 16 characters long, press the
Select key until you get to the left-most character of the password
field.

Enter this character string the same as you would enter an alphanu-
meric string, see chapter 2, "Entering Alphanumeric Strings," for more
information on how to enter the string. If you enter an invalid pass-
word, a message indicating that the password is invalid displays.

Use Admin Pwd

This option sets the Use Admin Pwd value. The range of values is On
or Off. If this value is set to On, access to the Administration menu
requires a password. If this value is set to Off, a password is not
required to access the menu. The default value is Off.

Password Disk

A password disk is available to set passwords for the Operator Con-
trol and the Administration menus. This allows you to control access
to the printer's configuration menu. When the password disk is
inserted in the printer's floppy disk drive, the Installation menu
appears in the printer's configuration menu.

Procedure

The floppy disk drive is located on the left side of the printer. Support for the password disk is only available through the control panel. To install the password disk from the control panel, use the following procedure:

1   **Make sure the printer is off line. The Off indicator light should be On.**

2   **With the label facing up, insert the password disk in the floppy drive.**

3   **Press the Back key and the main menu appears after the Password disk has been accessed (this may take about 30 seconds). Press the Next key until the message window displays**

    ```
    CONFIGURATION  INSTALLATION
    ```

4   **Press the Enter key. To view the options press the Next key. The options are Operator Passwrd, Use Operator Pwd, Admin Password, and Use Admin Pwd.**

5   **Operator Control Menu Password**

    To set a password for the Operator Control menu use the Operator Passwrd option to enter the password. Then set the Use Operator Pwd option to On to enable the password.

    Administration Menu Password

    To set a password for the Administration menu, use the Admin Password option to enter the password. Then set the Use Admin Pwd option to On to enable the password.

6   **When the passwords are enabled, return to the Main menu.**

    From the control panel press the Back key. Save the changes by selecting Yes. Remove the password disk from the floppy drive, and put the printer back on line. After you exit from the menu and take out the disk, the Installation menu is removed from the control panel message window.

All users accessing the password-protected menus will be asked to enter a valid password before access to the password-protected menu is granted. When the correct password is entered, the menu displays. The passwords for these two menus may be the same or different.

If you forget the password, it can be recovered as follows:

1   Insert the password disk containing the INSTALL.MNU file in the printer's floppy disk drive.

2   Access the Installation menu.

3   Select either the Operator Passwrd or the Admin Passwrd option and view the old password. If you need to change the password, enter the new password.

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4

Communications Menu

In This Chapter . . .

- Timeouts
- Serial communication
- AppleTalk communication
- Parallel communication
- Optional interface communication

The Communications Menu

The Communications menu options control default settings for the standard and optional printer-host communication interfaces. The Communications menu is under the Administration menu, which may be password protected. See chapter 3, the "Installation Menu" section, for more information about passwords.

Administration /Communications Menu

Timeouts
Serial
Parallel
AppleTalk
Network 1
Network 2

Timeouts

For many print jobs, the time required for transmission from host to printer is negligible. However, some print jobs may require more transmission and processing time due to their size. The options in the Timeouts menu help ensure reliable serial and parallel communications while preventing the printer from being tied up by any one job.

Communications / Timeouts Menu

PS Wait Timeout
Emul Timeout
Job Timeout
ESP Timeout

PS Wait Timeout

The PostScript Wait Timeout setting is the maximum number of seconds the printer waits for additional data for a PostScript job. The range is 0 to 99999 seconds and the default setting is 00030 seconds. If the PostScript emulation

■ Receives no additional data during this period of time

■ Receives no interface timeout

■ Receives no end of job notification

then the system generates an end of file to terminate the job and the next job in the queue begins. A value of 0 seconds means that the printer does not time out (it waits indefinitely).

Emul Timeout

The Emul Timeout setting is the maximum number of seconds the printer waits for additional data for a non-PostScript job in process. The range is 0 to 99999 seconds, and the default value is 00005 seconds. A value of 0 seconds means that the printer does not time out (it waits indefinitely).

Job Timeout

The Job Timeout option sets the maximum number of seconds that the printer will process a PostScript print job. A Job Timeout value greater than 0 seconds prevents jobs that may contain an unrecoverable loop from remaining in the printer and blocking other jobs. However, if the Job Timeout value is too short, jobs that require extensive processing may not finish before time expires. This timeout can be overridden by your application. If the PostScript emulation

■ Receives no additional data during this period of time

■ Receives no interface timeout

■ Receives no end of job notification

then the system generates an end of file to terminate the job and the
next job in the queue begins.The range is 0 to 99999 seconds, and
the default value is 0 seconds (no timeout).

ESP Timeout

The ESP timeout option sets the maximum number of seconds for the
printer to attempt an emulation selection using the Emulation Sensing
Processor. If ESP cannot select an emulation before this time expires,
the printer uses the default emulation to process the job (see chapter
5, "Emulations Menu"). The range is 0 to 99999 seconds, and the
default value is 00003 seconds. A value of 0 disables the timeout.
This option only applies to jobs received through the parallel and
serial interfaces.

Do not set the ESP Timeout to 0 seconds unless you are using the
PostScript interactive mode (see the Mode option in the following sec-
tion, "Serial Communication").

Serial Communication

The Serial menu controls the default settings for the serial communi-
cation interface values used for printer-host communications.

Communications / Serial Menu

Mode
Emulation
Min K Spool
Spool Timeout
End Job Mode
Baud Rate
Parity
Ignore Parity
RCV SW Flow Ctl
XMIT SW Flow Ctl
Data Bits

Stop Bits
HDWE Flow Ctl
PS Protocol

Mode

The Mode option allows you to enable or disable the interface. The options are Interactive, Noninteractive, or Disabled. If it is Disabled, the printer accepts no jobs through this protocol. Interactive mode allows two-way communication (reverse channel) between the host computer and the printer. Noninteractive is unidirectional communication from the host computer to the printer only. The default value is Interactive. If you are not using the serial interface, you may select Disabled to prevent any jobs from being received through that interface.

The printer must be restarted for changes to the Mode menu to take effect. Changing the Mode setting will cause the REBOOT NOW? prompt to appear. You can either choose to restart the printer now and this change takes effect immediately or you can manually restart the printer later and have this change take effect then.

Emulation

The Emulation option selects the serial interface's default emulation. The selections are ESP, Hexdump, PostScript, PCL 5, LN03+, ImPRESS, CCITT, Lineprinter, and HPGL. The factory default emulation is ESP. This change takes effect immediately.

» Note: If you want to emulate an Adobe printer when using the PostScript emulation, you must also set Mode to Interactive.

Min K Spool

This five-digit value sets the minimum number of kilobytes of RAM dedicated to the serial interface. Do not set this value greater than the K Mem for Spool value (Administration / Memory menu). The range is 00000 to 99999, and the default value is 00015. See "Dedicating

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Memory to an Interface" in chapter 7 for information about the Min K Spool setting.

The printer is immediately restarted when a change is made to this option. (For example, change the value to 35, press the Enter key, and the menu changes. Press the Line key and the printer automatically reboots.)

Spool Timeout

The Spool Timeout option sets the number of seconds the interface waits for additional data from the host computer before terminating a print job. The range is 00000 (no timeout) to 99999, and the default is 00030 seconds. If you change this setting, you must ensure that the new setting does not conflict with the PS Wait Timeout and Emul Timeout values.

If the Spool Timeout value expires before the printer has received all data for a job it is spooling, the printer terminates the spooled print job. You must turn the printer off and then on again before this change takes effect.

End Job Mode

This option enables or disables data stream sensing for end-of-document (EOD) terminator strings. These sequences allow hosts to enforce print job sequencing without considerations for interacting timeouts. The options are: None (the printer recognizes only the language specific terminator commands such as the PostScript ^D command), QMS EOD (%%EndOfDocument), and HP EOD (<ESC>%-12345X). Only one form of EOD may be used at a time. The default is QMS EOD. This change takes effect immediately.

See the *QMS Crown Network Notes* manual that came with your printer or the *End Job Mode on QMS Crown Printers* Application Note available on Q-FAX (document number 7002), the bulletin board, and CompuServe, for more information on End Job Mode.

Baud Rate

The Baud Rate option sets the data transmission rate used by the host over the serial channel. The baud rates are 19200, 38400, 300, 600, 1200, 2400, and 4800. The default value is 9600. Set this option to match the baud rate used by your host. You must turn the printer off and then on again before this change takes effect.

» Note: Baud rates 19200 and 38400 require RTS/CTS protocol.

Parity

The Parity option allows you to choose the type of parity checking performed by the host. Parity acts as a check bit to identify data transmission errors. The options are None, Mark, Space, Odd, and Even. The default value is None. Set this option to match the parity used by your host. You must turn the printer off and then on again before this change takes effect.

Ignore Parity

The Ignore Parity options are On and Off; the default is Off. You must turn the printer off and then on again before this change takes effect.

RCV SW Flow Ctl

If your host uses software flow control, the RCV SW Flow Ctl option allows you to choose the type of flow control used by the printer for its communication with the host. The choices are None, XON/XOFF, and ETX/ACK. The default value is XON/XOFF. Set this option to match the type of flow control expected by your host. You must turn the printer off and then on again before this change takes effect.

XMIT SW Flow Ctl

If your host uses software flow control, the XMIT SW Flow Ctl option allows you to choose the type of flow control used by the host for its communication with the printer. The choices are None, XON/XOFF, and ETX/ACK. The default value is None. Set this option to match the

type of flow control used by your host. You must turn the printer off
and then on again before this change takes effect.

Data Bits

The Data Bits option sets the number of data bits per character in the
data stream. The choices are 7 and 8 bits. The default value is 8 bits.
Set this option to match the number of data bits transmitted by your
host. You must turn the printer off and then on again before this
change takes effect.

Stop Bits

The Stop Bits option sets the number of stop bits per character in the
data stream. The choices are 1 and 2 bits. The default value is 1 bit.
Set this option to match the number of stop bits transmitted by your
host. You must turn the printer off and then on again before this
change takes effect.

Hdwe Flow Ctl

The Hdwe Flow Ctl option selects the type of hardware flow control
used by your host. The choices are DSR POL (default value: Lo),
DSR (default value: Off), DTR POL (default value: Lo), DTR (default
value: On), RTS (default value: Off), and CTS (default value: Off). If
your host uses hardware flow control, set this option to match the type
used by your host. You must turn the printer off and then on again
before this change takes effect.

PS Protocol

The PS Protocol option sets the binary communications protocol
(BCP) for communicating over a serial interface to a PostScript
printer. The choices are normal, normal fixed, binary, binary fixed.
The default value is normal. This change takes effect immediately.

See appendix E, "Manual Updates," for more information on PS Protocol.

Choices	Normal—Enable standard, ASCII hex protocol. Data is sent and received in ASCII format. This mode is recommended if you do not print binary data. It was designed for data in the printable ASCII range. Print jobs can alter the PS protocol value through PostScript operators.
	Normal Fixed—Enable standard, ASCII hex protocol. Print jobs can not alter this value through PostScript operators.
	Binary—Enable binary communications protocol. Print jobs can alter this value through PostScript operators. Data in the printable ASCII range also prints.
	Binary Fixed—Enable binary communications protocol. Print jobs
Default	Normal

Parallel Communication

The Parallel menu controls the default settings for the parallel communication interface.

Parallel / Communications Menu

Mode
Emulation
Min K Spool
Spool Timeouts
Data Bits
End Job Mode
PS Protocol

Mode

The Mode option enables or disables the parallel interface. The
default value is Enabled. If you are not using the parallel interface,
you may select Disabled to prevent any jobs from being received
through this interface.

The printer must be restarted for changes to the Mode menu to take
effect. Changing the Mode setting will cause the `REBOOT NOW?`
prompt to appear. You can either choose to restart the printer now
and this change takes effect immediately or you can manually restart
the printer later and have this change take effect then.

Emulation

The Emulation option selects the parallel interface's default emula-
tion. The selections are ESP, Hexdump, PostScript, PCL 5, LN03+,
ImPRESS, CCITT, Lineprinter, and HPGL. The factory default emula-
tion is ESP. This change takes effect immediately.

Min K Spool

This five-digit value sets the minimum number of kilobytes of RAM
dedicated to the Parallel interface. Do not set this value greater than
the K Mem for Spool value (Administration / Memory menu).The
range is 00000 to 99999 and the default setting is 00015. See "Dedi-
cating Memory to an Interface" in chapter 7 for information about the
Min K Spool setting.

The printer is immediately restarted when a change is made to this
option. (For example, change the value to 35, press the Enter key,
and the menu changes. Press the Line key and the printer automati-
cally reboots.)

Spool Timeout

The Spool Timeout option sets the number of seconds the parallel
interface waits for additional data from the host before terminating a
print job. The range is 00000 (no timeout) to 99999, and the default is
00030 seconds. If you change this setting, you must ensure that the

new setting does not conflict with the PS Wait Timeout and Emul Timeout values.

If the Spool Timeout value expires before the printer has received all data for a job it is spooling, the printer terminates the spooled print job. You must turn the printer off and then on again before this change takes effect.

Data Bits

The Data Bits option sets the number of data bits per character in the data stream from the host. The choices are 7 and 8 bits. The default value is 8 bits. Set this value to match the number of data bits transmitted by your host.You must turn the printer off and then on again before this change takes effect.

End Job Mode

This option enables or disables data stream sensing for end-of-document (EOD) terminator strings. These sequences allow hosts to enforce print job sequencing without considerations for interacting timeouts. The options are: None (the printer recognizes only the language specific terminator commands such as the PostScript ^D command), QMS EOD (%%EndOfDocument), and HP EOD (<ESC>%-12345X). Only one form of EOD may be used at a time. The default is QMS EOD. This change takes effect immediately.

See the *QMS Crown Network Notes* manual that came with you printer, for more information on End Job Mode.

PS Protocol

The PS Protocol option sets the binary communications protocol (BCP) for communicating over a parallel interface to a PostScript printer. The choices are normal, normal fixed, binary, binary fixed. The default value is normal. This change takes effect immediately.

See appendix E, "Manual Updates," for more information on PS Protocol.

Choices	Normal—Enable standard, ASCII hex protocol. Data is sent and received in ASCII format. This mode is recommended if you do not print binary data. It was designed for data in the printable ASCII range. Print jobs can alter the PS protocol value through PostScript operators.
	Normal Fixed—Enable standard, ASCII hex protocol. Print jobs can not alter this value through PostScript operators.
	Binary—Enable binary communications protocol. Print jobs can alter this value through PostScript operators. Data in the printable ASCII range also prints.
	Binary Fixed—Enable binary communications protocol. Print jobs
Default	Normal

AppleTalk Communication

The AppleTalk menu controls the default settings of the AppleTalk interface.

» Note: AppleTalk does not have an option for Emulation. Only PostScript jobs may be received over the AppleTalk interface.

Communications / AppleTalk Menu

Mode
Connection
Min K Spool

Mode

The Mode option enables or disables the AppleTalk interface. The default is Enabled.If you are not using the AppleTalk interface, you

may select Disabled to prevent any jobs from being received through this interface. The enabled mode allows communication between the host computer and the printer.

The printer must be restarted for changes to the Mode menu to take effect. Changing the Mode setting will cause the REBOOT NOW? prompt to appear. You can either choose to restart the printer now and this change takes effect immediately or you can manually restart the printer later and have this change take effect then

Connection

The Connection option selects the type of connection you are using. The options are Conventional and Spool, with Conventional being the default. Spool allows you to have multiple AppleTalk connections and accepts (spools) more than one print job at a time. Workstations are available while jobs are printing. Conventional allows one AppleTalk connection and accepts only one print job at a time. If two users send print jobs to the printer, the workstation belonging to the first user is unavailable until the first job has been printed, and the workstation belonging to the second user is unavailable until both jobs have been printed. Select Conventional to print directly to the printer. You must turn the printer off and then on again before this change takes effect.

Min K Spool

This five-digit value sets the minimum number of kilobytes of RAM dedicated to the AppleTalk interface. Do not set this value greater than the K Mem for Spool value (Administration / Memory menu).The range is 00000 to 99999, and the default is 00015. See "Dedicating Memory to an Interface" in chapter 7 for information about the Min K Spool setting.This change takes effect immediately.

The printer is immediately restarted when a change is made to this option. (For example, change the value to 35, press the Enter key, and the menu changes. Press the Line key and the printer automatically reboots.)

Network 1 and Network 2

You may order optional interfaces for your printer so you can connect to other networks. (See you QMS vendor for information on the available combinations of optional network interfaces for your printer.)

If the optional interfaces are installed, they appear as Network 1 and Network 2 in the Communications menu. See the documentation that comes with your interface to connect your printer to the network and configure it for network printing.

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5

Emulations Menu

In This Chapter . . .

- ESP Default settings
- PostScript emulation settings
- PCL 5 emulation settings
- LN03+ emulation settings
- imPRESS settings
- LinePrinter emulation settings
- HP-GL emulation settings

The Emulations Menu

The options in the Emulations menu of the Administration menu select the default values for the various languages and emulations supported by the QMS 4525 Print System. The Administration menu may be protected by a password. See chapter 3, "Installation Menu," for more information.

Administration / Emulations Menu

ESP Default
PostScript
PCL 5
LN03
imPRESS
Line Printer
HP-GL

ESP Default

The ESP Default option selects the emulation the printer uses if the Emulation Sensing Processor (ESP) cannot identify the emulation of a print job. Occasionally, ESP may not be able to identify the emulation. In this case, the ESP Default emulation is used.

Emulations / ESP Default Menu

PostScript
PCL 5
LN03
imPRESS
Line Printer
HP-GL
CCITT

The default value is PCL 5. If your print jobs are predominately one emulation, select that emulation as the ESP default.

PostScript

Select PostScript in the Emulations menu to choose which level of PostScript the printer uses to print your files.

Emulations / PostScript Menu

PostScript Emulation Level

PostScript Emulation Level

The PostScript Emulation Level allows you to select PostScript Level 2, Level 1 B/W for Level 1 files that use no color operators, or Level 1 Color for Level 1 files that use color operators. Level 2 works for Level 2 files and most Level 1 files. The default is Level 2.

PCL 5

The PCL 5 menu maintains PCL 5 emulation attributes such as default font, symbol set, and point size. There are nine configuration settings. See appendix E, "Manual Updates," for updated information on the PCL 5 emulation DOC commands. The *HP PCL 5 Emulation Technical Reference* contains more detailed information on the emulation. In addition, the *HP PCL 5C Technical Support Notes*, available free through the QMS Bulletin Board, Q-FAX, and CompuServe, has information on HP PCL 5C. (See appendix A, "QMS Customer Support," to find out how to access the bulletin board, Q-FAX, and CompuServe.)

Emulations / PCL 5 Menu

Default Font
Symbol Set
Lines Per Page
Line Termination
Point Size X100
Retain Temporary
Scalable Fonts
Default Font ID
Monochrome G/L 2

Default Font

Sets the printer's default font.

Menu	Administration/Emulations/PCL 5/Default Font
Range	Courier12, Courier12bold, Courier12italic, Courier10, Courier10bold, Courier10italic, Lineprinter, Times*, Times*italic, Times*bold, Times*blditalic, Univ*, Univ*italic, Univ*bold, Univ*blditalic, Unicond*, Unicond*italic, Unicond*bold, Unicond*blditlc, Select by id,
Default	Courier12
Notes	Fonts with an asterisk "*" in their names are scalable. Their default point size is set by the Point Size X100 option. Choosing Select by id as the default font selects the font by ID or unique font index.
	All Courier fonts (courier10 and courier12) and Lineprinter are bitmap fonts, so they have a fixed point size. Selecting a bound, bitmap font overrides the default settings for symbol set and point size. An unbound font uses the specified default symbol set if possible, and a scalable font uses the default font size.

Symbol Set

Selects the default symbol set for the emulation. Not all symbol sets are available with certain resident fonts. In particular, the Desktop, PS Math, Math 8, Microsoft Pub, Pi Font, PS Text, Ventura Intl, Ventura

Math, Ventura US, and Windows symbol sets cannot be used with the resident bitmap fonts: Courier10, Courier10bold, Courier10italic, Courier12, Courier12bold, Courier12italic, and Lineprinter.

The five Dingbat symbol sets (PS-Zapf-Dingbats, Ventura-Dingbats, Zapf-Dingbats-100, Zapf-Dingbats200, Zapf-Dingbats300) can be used with all fonts.

Menu	Administration/Emulations/HP PCL 5/Symbol Set
Choices	Roman-8, PC-850, PC8-US, PC8-DN, ECMA-94, Legal, HPGerman, HPSpanish, ISO-2, ISO-4, ISO-6, ISO-10, ISO-11, ISO-14, ISO-15, ISO-16, ISO-17, ISO-21, ISO-25, ISO-57, ISO-60, ISO-61, ISO-69, ISO-84, ISO-85, Desktop, PS Math, Math 8, Microsoft-Pub, Pi-Font, PS-Text, Ventura-Intl, Ventura-Math, Ventura-US, Windows, PS-Zapf-Dingbats, Ventura-Dingbats, Zapf-Dingbats100, Zapf-Dingbats200, Zapf-Dingbats300
Default	Roman-8
Notes	If a mismatch between symbol set and fonts occurs, the standard PCL font selection mechanism is used to locate a font that matches the selected symbol set. With the standard set of fonts distributed for your printer, this matches the Times* font, but other user-installed fonts could change this result. See chapter 8, the "Font Selection" section, of the *HP PCL 5 Technical Reference Manual,* for more information on selecting PCL 5 fonts.

Lines Per Page

Sets the default "page length" value for PCL, which determines the page size used. Some factors used in determining the number of lines are the page size, the font, and the point size X100.

Menu	Administration/Emulations/HP PCL 5/Lines Per Page
Range	1 to 128
Default	60

Line Termination

Indicates the default line termination mode. This setting specifies the treatment of line feeds and carriage returns. (See Appendix E, "Manual Updates," for more information on line termination).

Menu	Administration/Emulations/PCL 5/Line Termination
Choices	CR=CR LF=LF
	CR=CR+LF LF=LF
	CR=CR LF=CR+LF
	CR or LF=CR+LF
Default	CR=CR LF=LF

Point Size X100

Sets the point size for scalable default fonts in increments of .25 points.

Menu	Administration/Emulations/PCL 5/Point Size x100
Range	00025 (6.25 ppoints) to 99975 (249.75 points)
Default	01200 (12 points)
Notes	If the font is not scalable or if a bitmap font is specified, the setting is ignored.

Retain Temporary

Allows you to control the PCL print environment across print jobs.

Menu	Administration/Emulations/PCL 5/Retain Temporary
Choices	Off, On, On Compatibility
	Off——Resets PCL to its default state at the end of each PCL print job, executes an implicit <ESC>E at the start and end of the job, and deletes any temporary fonts, macros, and patterns.
	On——Resets PCL to its default state at the end of each PCL print job. Temporary fonts, macros, and patterns from previous PCL jobs are retained in memory after the print job has completed. You can recall these downloaded fonts, macros, or patterns from within your PCL file without having to download them again.
	On Compatibility——Retains the entire state of PCL as well as the temporary macros, fonts, and patterns from previous PCL jobs.
Default	Off
Notes	A retained state is cleared if the user does the following:
	■ Explicitly clears the PCL state by sending an <ESC>E or Printer Job Language.
	■ Turns off the printer. (Note that if Retain Temporary is set to On or On Compatibility and power is turned off and back on again, all temporary objects on the disk's standard resource will become permanent. RAM-based temporary objects are lost).
	■ Changes any PCL front panel option.
	■ Sends any PCL-specific DOC commands (except the DOC emulation command).
	■ Sends a PCL job from a different communications port. For example, the state set up by a PCL job using the parallel port is cleared if a subsequent PCL job arrives at the serial port).

Scalable Fonts

Specifies whether to enable or disable the printing of PCL 5 scalable fonts by an application. This feature may be useful when printing PCL 4 documents which may inadvertently select unwanted scalable fonts.

Menu	Administration/Emulations/HP PCL 5/Scalable Fonts
Choices	Enable, Disable
	Enable—Allows selection of scalable fonts. When you print PCL 4 documents, PCL 5 may substitute scalable fonts that could cause your PCL 4 documents to print incorrectly.
	Disable—Prints using bitmap fonts only.
Default	Enable

Default Font ID

Sets the Default Font ID when the Default Font is selectbyid. This allows for selection of fonts only on the current resource. Using this command to specify a font ID as the default font and then using the Default Font command to select the selectbyid value overrides the symbol set value. If a font with the same ID exists, it is selected as the Default Font.

Menu	Administration/Emulations/HP PCL 5/Default Font ID
Default	Selectbyid value
Range	0 to 32767
Note	When a default font ID is selected, the default Symbol Set is overwritten.

Monochrome GL/2

Allows your printer to emulate a monochrome or color plotter.

Menu	Administration/Emulations/HP PCL 5/Monochrome GL/2
Choices	On, Off
	On—Sets the printer to monochrome (2 pen).
	Off—Sets the printer to color (8 pen). Since a monochrome print system has two pen colors only (black and white), grayscale patterns are substituted for other colors.
	The printer maps each pen to its assigned color, then converts the color to a grayscale using the National Television System Committee (NTSC) color standard for luminosity coefficients (Additive System):
	$Y = .3R + .59G + .11B$
	Examples on How to Use the Color Standard Formula
	White $\quad Y = [(1*0.3) + (1*0.59) + (1*0.11)]$—100% gray Black $\quad Y = [(0*0.3) + (0*0.59) + (0*0.11)]$—0% gray Red $\quad\;\; Y = [(1*0.3) + (0*0.59) + (0*0.11)]$—30% gray Green $\quad Y = [(0*0.3) + (1*0.59) + (0*0.11)]$—59% gray Yellow $\;\; Y = [(1*0.3) + (1*0.59) + (0*0.11)]$—89% gray Blue $\quad\;\; Y = [(0*0.3) + (0*0.59) + (1*0.11)]$—11% gray Magenta $Y = [(1*0.3) + (0*0.59) + (1*0.11)]$—41% gray Cyan $\quad\; Y = [(0*0.3) + (1*0.59) + (1*0.11)]$—70% gray
Default	On
	Pen Color Defaults:
	Pen 0 = White Pen 1 = Black Pen 2 = Red Pen 3 = Green Pen 4 = Yellow Pen 5 = Blue Pen 6 = Magenta Pen 7 = Cyan

Emulations LN03+ Menu

The LN03 Plus emulation has the following configuration options:

Emulations / LN03+ Menu

Product ID
Autowrap
Paper Size
Paper Override
X-Origin
Y-Origin
Reset Override
Orientation

Product ID

The Product ID setting is the emulation printer model. If your host sends a Device Attributes request to the printer, the printer responds with the Product ID. You can select LN03, LQP02, or LA100. The factory default setting is LN03.

AutoWrap

The Autowrap setting determines whether text that exceeds the right margin "wraps" to the next line on the page. The range is On and Off. The default setting is On (wrap text to next line).

Paper Size

The Default Paper option specifies the paper size that is to be used at power up or when no paper size is specified. Available paper sizes are letter, A4, and legal. The default value is letter.

Paper Override

The Paper Override option selects the paper selection. The range of possible values are On and Off. The default is Off. If set to Off, the emulation uses the transformation point for the size of paper selected

and uses the current paper size (does not change paper trays). If
Paper Override is set to On, the emulation uses the transformation
point for the size of paper selected and uses the specified paper size.

X Origin Inset

The X Origin Inset option moves the lower left corner of the image to
the right from 0 to 300 dots (1 inch at a resolution of 300 dpi). Use this
option to eliminate clipping of the right edge of the image on some
systems. The default offset is 75 dots.

Y Origin Inset

The Y Origin Inset option moves the lower left corner of the image
downward from 0 to 300 dots (1 inch at a resolution of 300 dpi). Use
this option to eliminate clipping of the top edge of the image on some
systems. The default offset is 75 dots.

Reset Override

The Reset Override option determines whether the printer automati-
cally resets to the initial power up configuration before every print job
or whether it retains the configuration from the previous print job. The
range of possible values are Off and On. The default setting is Off.

Orientation

The Orientation option specifies the orientation to be used by the
LN03 Plus emulation. The range of possible values are Portrait or
Landscape. The default value is Portrait. Portrait orientation has the y
axis parallel to the long edge of the page. Landscape orientation has
the y axis parallel to the short edge of the page.

» Note: This option applies only to the LN03 Plus emulation. The LN03
Plus emulation respects orientation only when it is set through the
LN03 Plus emulation menu or through the LN03 emulations's
orientation command.

imPRESS

Emulations / ImPRESS

Form Area Size

The Form Area Size option in the imPRESS menu establishes the maximum size (in kilobytes) for forms that are to be inserted into imPRESS print jobs. The range is 0 to 10240 KB, and the default is 0 KB.

Lineprinter

The Lineprinter menu controls default settings for the Lineprinter emulation, which prints simple byte-oriented line printer files. A byte-oriented line printer handles jobs consisting of a series of bytes, where lines are delimited by carriage returns and line feed characters.

Emulations / Line Printer

Font
Point Sz 100ths
Character Map
Line Numbering
Tab Stops
LPisCRLF
CRisCRLF
FFisCRFF
Orientation
Autowrap
Lines Per Page
Margins

Font

This option is an alphanumeric entry that specifies the font to be used to print the current job. Any PostScript fonts available on the printer

can be used. To see a list of PostScript fonts available, print an advanced status page. The default is Courier.

Point Size in 100ths

Use this option to specify the point size (in .01 point increments) of the font to be used to print the current print job. The range is 400 (4 points) to 25600 (256 points). The default is 850 (8.5 points).

Character Map

This selection specifies the type of character map to be used. The choices are ASCII and EBCDIC. The default is ASCII.

Line Numbering

Line numbering specifies that a five-digit number is to be prefixed to the beginning of each line. The choices are On and Off with Off being the default.

Tab Stops

This option specifies the number of spaces between tab stops. The minimu number of spaces is 0 and the maximum is 256. The default is 8.

LF is CRLF

Use this option to stipulate whether each line feed in the print job is translated to a carriage return/line feed combination. The choices are On and Off with On being the default.

CR is CRLF

CRISCRLF determines whether each carriage return in the print job is translated to a carriage return/line feed combination. The choices are On and Off with Off being the default.

FF is CRFF

This option stipulates whether each form feed in the print job is translated to a carriage return/form feed combination. The options are On and Off with On being the default.

Orientation

This option specifies whether text is printed in Portrait or Landscape orientation. The default is Landscape.

» Note: The two ways to set the display orientation for the line printer are either through the control panel using this Orientation option or through the Lineprinter emulation LPorientation DOC command.

Autowrap

This option indicates whether long lines are to be wrapped onto the next line instead of being truncated. The options are On and Off with Off being the default.

Lines Per Page

This option specifies the number of lines printed on a page before an automatic page eject. Interline spacing is set to the selected point size. Logical pages consisting of more lines than specified are split into multiple pages. The minimum Lines Per Page setting is 1, and the maximum is 128. The default is 66.

Margins

This option specifies the left, right, top, and bottom margins from 0 to 17 inches. The range for each margin is 0000 to 1700, and the default is 0.

HP-GL

The HP-GL options contains settings for the default conditions of the HP-GL (plotter) emulation.

Emulations / HP-GL

Plotter
Scaling Percent
Origin
Reverse Image
Enhanced Mode
Expand Mode
Paper Type
Pen 1
Pen 2
Pen 3
Pen 4
Pen 5
Pen 6
Pen 7
Pen 8

Plotter

The Plotter option has a selection of choices for the type of HP-GL compatible plotter that the QMS 4525 Print System emulates for HP-GL jobs. The choices are 7470A, 7475A, 7550A, and ColorPro. (Selecting ColorPro does not result in color printing. Colors are represented by varying gray shades.) The default value is 7550A.

Scaling Percent

The Scaling Percent option is a numeric value for the percentage of enlargement or reduction of the plot. The minimum value is 1 and the maximum is 150. The default value is 100 (same size).

» Note: To scale plots, select the paper size originally used for the plot in the Paper Type menu; then enter the reduction or enlargement needed to fit the plot on the new page in the Scaling Percent menu. If necessary, enter new x,y coordinates in the Origin menu to reposition the plot on the page.

Origin

The Origin option is a numeric value for the distance to move the plot origin along the x and y axes in increments of .001". The minimum value is 0, and the maximum values are 8500 (x axis) and 11000 (y axis). The default values are 0000 (x axis) and 00000 (y axis). Values of 0 (both x axis and y axis) align the plot origin with the lower-left corner of the paper. The default values move the plot origin just inside the boundaries of the printable region of the page. Setting values less than the defaults or too high may result in lost portions of the plot when printed.

Reverse Image

The Reverse Image option has two choices for printing white plots on a black background. The range of possible choices are On or Off. The default value is Off (print black on a white background). If you select On, black lines in the plot print in white, and white lines print in black.

Enhanced Mode

The Enhanced Mode option has two choices that specify the resolution of the downloaded character set. The choices are Off (4x8 character grid) or On (32x32 character grid). The default value is Off.

Expand Mode

The Expand Mode option expands the default scaling points (P1 and P2), the hard-clip plotting range, and the maximum plotting area to the clip region of the QMS 4525 printer. The range of possible values are On or Off. The default value is Off (do not expand).

Paper Type

The Paper Type option allows you to scale an image to the defined paper size when printing a plot image. The choices are A (8.5" x 11"), A4 (210 mm x 297 mm), B (11" x 17"), A3 (297 mm x 420 mm), or Scale to Paper. The default value is A.

Pens 1-8

The Pen options are choice values for the width and color of the 8 "pens" the printer uses when printing HP-GL emulation jobs. The pen width may be set from 0 (0 mm wide) to 60 (60 mm wide). The pen color may be set from 1 to 8. The default settings are as follows:

Pen	Width	Color
1	7 mm	Black
2	3 mm	Black
3	3 mm	Red
4	3 mm	Green
5	3 mm	Blue
6	3 mm	Violet
7	3 mm	Orange
8	3 mm	Brown

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HP-GL

6

Special Pages and Startup Options Menus

In This Chapter . . .

- Header and trailer pages
- Input and output bins for header and trailer pages
- Status page types
- Start-up options

Special Pages Menu

The Special Pages options allow you to configure your printer to print header and trailer pages.

Administration / Special Pages Menu

Header Page
Header Inputbin
Trailer Page
Trailer Inputbin
Status Page Type

Header Page

This option controls whether or not a header page prints before each job. This option is either On or Off with the default of Off. (See the *QMS Crown Document Option Commands* manual for information on header page contents.)

Header Inputbin

This option selects the input bin from which the header page is printed. The range of possible values or Upper or Lower. Upper selects the upper bin, and Lower selects the lower bin. The default value is Upper.

Trailer Page

This option allows you to specify if and when a trailer page is printed after each job. The choices are On, Off, On Error, and Errors Only. The default value is Off.

For LN03 Plus print jobs only, setting this option to On Error prints a trailer page (with error messages generated during processing and printing of your job) only if any error occurred. Setting it to Errors Only prints error messages on the trailer page and omits other trailer page information. (See the *QMS Crown Document Option Commands* manual for information on the trailer page contents.)

Trailer Inputbin

This option selects the input bin from which the trailer page prints.
The range of possible values are Upper or Lower. Upper selects the
upper bin, and Lower selects the lower bin. The default value is
Upper.

Status Page Type

This option selects the status page type. The range of possible values
are Standard and Advanced. The default is Standard. Standard
selects the standard one-page status page that lists the printer identi-
fication information, current memory configuration, timeouts, commu-
nication settings, input buffer sizes, and available fonts. Advanced
selects the longer status page that contains the same information as
the standard status page as well as configuration menu settings,
fonts, and downloaded emulations. Printing a status page is a two-
step procedure: identify the type of status page you want to print, and
then print it using the Status Page key.

Startup Options Menu

The options in the Startup Options menu allow you to configure your
printer to run certain options every time the printer is turned on.

Administration / Startup Options Menu

Do Start Page
Do Sys Start
Do Error Handler

Do Start Page

Do Start Page allows you to specify whether or not a start-up page is
printed every time the printer is turned on. For this option to take
effect, the printer's power must be turned off and on again. The
options are Yes and No with the default being Yes.

Do Sys Start

Sys/Start is a PostScript file residing on the hard disk. Whenever you turn on the printer, and the Do Sys Start option is enabled, the controller checks the hard disk for a SYS/START file and, if it finds one, executes the file. The options are Yes and No. The default is Yes.

Creating a Sys/Start file
Detailed information on creating a SYS/START file is available from Q-FAX. (See appendix A, "QMS Customer Support," for information on accessing Q-FAX.)

Do Error Handler

This option activates a debugging tool that identifies PostScript errors during a print job. In order for this option to take effect, the printer's power must be turned off and then on again. The options are Yes and No. The default is No. See the *PostScript Language Reference Manual* for more information on PostScript errors.

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7

Memory Menu

In This Chapter . . .

- Introduction to memory management
- Memory definitions
- Evaluation of your printing environment
- Memory clients

Memory Menu

The memory menu allows you to allocate system memory (RAM) among the various memory clients. Read the following sections to learn how to use the Memory menu to best configure your printer's memory.

Administration / Memory Menu

K Mem For Spool
K Mem For PSHeap
K Mem PS Fonts
K Mem Emulation
K Mem Display
K Mem Disk Cache

Memory: An Overview

Memory allows your printer to store and retrieve information that is required to perform many of its tasks. The memory requirements of each printer are dictated by the applications that are to be run. The QMS 4525 Print System comes standard with 32 MB of memory.

The memory is divided among blocks or memory clients, each of which is dedicated to a specific printing and application purpose. QMS Crown printers provide you with the unique ability to distribute your printer's memory among the various memory clients where it can best serve your specific printing needs. This chapter provides information on memory management so you can get the most from your QMS 4525 Print System.

Generally, there are two main reasons for wanting to reconfigure your printer's memory:

■ To achieve maximum performance

■ To enable additional features

The ability to configure your printer's memory does not necessarily mean that you must change your current configuration. If you are presently using all the features you need, and the printer is performing efficiently, you should not feel compelled to reconfigure your printer's memory. Just remember that if your printing needs change, not only do you have the ability to increase the amount of printer memory, but you also can redistribute it where you feel it would best meet your printing requirements.

QMS Memory Management

Managing the memory on your printer is much the same as managing your personal income. In money management, you have a certain amount of income and many ways of spending that income. You decide where that money goes according to what is important to you. There is no single correct way to manage money, but there is one best way for you according to your financial obligations. Just as long as your method works for you.

The same is true for managing the memory on your printer. There is no single correct way for everyone to allocate available printer memory. There is, however, a best way to configure your printer's memory for maximum efficiency in your specific printing environment. For example, if you use a large number of PostScript fonts of various point sizes, you may want to increase the amount of memory allocated to the area specified for PostScript fonts. Or you may want to increase memory to the area that minimizes slowdowns when collating large print jobs.

Memory configuration affects these things as well as the number of jobs that can be accepted by the printer, the number of options available simultaneously, the number of downloadable fonts and emulations that can be stored, and overall printer performance.

QMS Memory Definitions

Before you can configure your printer's memory efficiently, you must first understand the different types of memory and how they work together. QMS Crown documentation uses the following memory terms:

Memory—Memory allows your printer to store and retrieve information. It is the space within your printer where information is stored while being actively worked on.

Memory Clients—A memory client is a block of memory dedicated to a specific function. Each memory client controls certain features. When insufficient memory is allocated to a specific client, the features it controls may not be accessible.

Excess Memory Client—The memory remaining after providing all the other memory clients with their specified amounts of memory is automatically added to the excess memory client. The display list is the excess memory client for the QMS 4525 Print System.

Storage—Storage is a device in or on which information can be kept. There are three main types of storage, ROM, RAM and hard disk drives. ROM stores read-only data, RAM represents temporary storage, and hard disk drives hold information on a more permanent basis (see the following definitions).

ROM (Read Only Memory)—This type of memory contains data and/or machine-executable instructions that can be read but not modified. This information is not lost when the printer is turned off.

RAM (Random Access Memory)—RAM is the memory your printer uses to perform each task. The QMS 4525 Print System has 32 MB of RAM. It can be written to and read from. Once a task is complete, the memory is free again to be used for another file. This memory is volatile, so if your printer loses power while a file is being sent, you must resend the file. The number and type of features you can run on your printer simultaneously depend on the amount of RAM your printer has and how that RAM is distributed.

RAM Disk—Also called a virtual disk, the RAM disk is an area of RAM that is used to simulate an additional hard disk. Data can be

written and read more quickly than on a hard disk, but a RAM disk loses any information stored on it when the printer's power is turned off. The frame buffer and spooling buffer are RAM disk clients.

Hard Disk—The QMS 4525 Print System comes standard with a 200 MB internal hard disk. The hard disk serves as secondary storage places for such items as downloaded fonts and emulations. Hard disks are also used to increase the amount of collation that can be accepted and provide a secondary storage area for spooled data.

SCSI-2 (Small Computer System Interface)—The printer's SCSI-2 port allows you to connect up to 6 external SCSI hard disks, providing storage for fonts, emulations, and other files.

» Note: You will need an adaptor cable to connect SCSI-1 external hard drives to the printer's DB50 SCSI-2 port.

Non-volatile Memory—The options you select in your printer's Configuration menu such as emulations, memory settings, and input bins are saved to non-volatile memory. This means that when you turn off your printer, you do not lose this information.

Volatile Memory—This type of memory is lost when the printer loses power. For example, most RAM is volatile.

Physical Memory—The physical memory on your printer is equal to the amount of RAM installed.

Virtual Memory—Virtual memory extends the effective size of the printer's memory by using a disk file or swap file to simulate additional memory space. It enables the hard disk to accept data swapped from RAM to free temporarily the RAM for other tasks.

Spool (Simultaneous Print Operations On Line)—Spooling is temporary storage to hold print jobs until the printer is available to process them.

Evaluation of Your Printing Environment

The first step in allocating your printer's memory is to define your printing needs. Each of your printer's features requires a minimum amount of memory. If you use a feature, you must allocate enough memory to the client which controls it. On the other hand, if there are features you do not use, you can move excess memory in the clients which control the unused features to other clients that need additional memory.

Evaluation Questions

To get a better idea of what your printing requirements and your printer's capabilities are, answer the following questions:

1   How much RAM does your printer have?

2   What size internal hard disk does your printer have?

3   Does your printer have any external hard disks connected? If so, how many and what size?

4   Which resident emulations will you be running?

5   Will you be loading any non-resident emulations to memory? If so, how many and which ones?

6   How many printer ports will be connected?

7   Do you have an optional network interface connected?

8   How many people will be using this printer simultaneously?

9   How many downloadable fonts will you be using? What sizes? From which emulations?

10 Will you use many different sizes of fonts/typefaces?

11 How large will the files be that you are printing? How large is the largest file you will be printing?

12 Are most of your files text, or are any graphics intensive?

13 Will you want to download fonts, forms, or operators to memory?

14 Will you be duplexing documents?

15 Will you be collating documents? If so, how large and complex will these documents be?

16 What paper sizes will you be using?

After you have answered all of these questions, read the following section to see which memory clients control the features you plan to use and which memory clients control features you do not need.

Memory Clients

Memory clients are blocks of printer memory that are dedicated to a specific purpose. Each of the memory clients is located in the Administration/Memory menu of your printer's Configuration menu. When you allocate memory to a specific client through the control panel, it is allocated in kilobytes (KB). Each time you make changes in the Memory menu, print out a status page to confirm the memory reallocation. (Refer to chapter 2, "Printer Configuration," for information on how to print a status page.) The sizes listed on the status page are in bytes, so you must divide the numbers on the status page by 1024 to determine the equivalent number of kilobytes entered through the control panel.

»   Note: The value for each memory client must be divisible by 4 KB. Therefore, if a value is entered that is not evenly divisible by 4 KB, it is automatically converted to the next lower value that is divisible by 4 KB. For example, if you enter 102 KB, the actual value is lowered to 100 KB, assuming there is enough memory available to allocate to this client.

Frame Buffer

Also called K Mem Framebuff, the frame buffer memory client holds rasterized or bitmapped images of page faces (single sides of duplexed pages) which are ready to be sent to the physical print engine. Any task that affects the page faces, such as duplexing,

increasing paper size, or printing at a higher resolution, may require increasing the amount of memory allocated to this client to boost print speed and overall system throughput. If not enough memory is allocated to this client, memory is taken from the display list to complete a print job.

The frame buffer memory client is not configurable on the QMS 4525 Print System, but you can manipulate this client by taking memory from other clients. For example, you can add memory to the frame buffer by reducing the amount of memory dedicated to other memory clients, such as the emulation client. After changing the memory configuration, print a status page to ensure the frame buffer has enough memory.

A frame holds the contents of a single page image. Because the frame buffer memory is so critical to the actual printing of a page, its allocation takes precedence over that of other memory clients. Therefore, you cannot set the frame buffer to an amount smaller than that required to image a page of the selected size.

The number of frames needed to print at engine speed is engine specific and depends on whether you are printing simplex or duplex and what paper size you are using, and at what resolution.

» Note: There are minimum size requirements for the frame buffer memory client for different paper sizes. For example, when printing on legal large paper, you must have at least 2800 KB. To increase the frame buffer, you must reduce the amount of memory dedicated to other memory clients, such as the display list. After changing the memory configuration, print a status page to ensure that the frame buffer has enough memory.

K Mem for Spool

Also known as Host Input and Spool Buffers, this memory client stores incoming data from all the interfaces until the physical print engine can print the job. When enough memory is allocated to this client, the host becomes free more quickly, and the number of jobs that the printer can accept simultaneously is increased. You should consider the amount of data being sent simultaneously when allocating memory to the spool buffer. If available, a hard drive can supplement this client with additional memory needed for spooling. The system

will not allow you to set this memory client below its minimum setting. The range is 128 to 10240 KB. The default value is 06464.

» Note: While increasing this client is beneficial in reducing network traffic, throughput speed is not necessarily increased.

If you change the K Mem for Spool value, the printer automatically restarts after you save your changes and exit from the configuration menu.

Dedicating Memory to an Interface

Each host interface connection on the printer has its own menu. Within each of these menus is an option for allocation of Min K Spool. Use the Min K Spool setting found under each interface in the Communications menu to dedicate a portion of float memory to an interface. The value of an interface's Min K Spool is the number of kilobytes dedicated to spooling jobs received over that interface. The default value for each interface's dedicated spooling space is 15 KB.

If you want to increase the amount of memory dedicated to an interface you may change the Min K Spool value through the printer control panel. Min K Spool is a numeric value. The maximum amount of memory that you may dedicate to a single interface is the amount of float memory available in the printer. The minimum amount is 0 KB.

» Note: Setting the value to 0 KB does not disable the interface. The interface may not be able to get any memory if it is set to 0 KB. Any job spooling for an interface with 0 KB Min K Spool must be split with other interfaces from the available float memory.

Increasing an interface's Min K Spool value subtracts from the available float memory. For example, setting the serial interface Min K Spool to 20 KB takes an additional 5 KB away from the float memory. If you increase an interface's dedicated spooling memory, you do not change the interface's priority. All jobs received by the printer are handled on a first-come, first-served basis, regardless of the interface receiving the jobs.

If you do not use one or more of the printer interface connections, you may disable that interface. Any disabled interface's Min K Spool area

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(15 KB) is added to the available float memory. Each interface menu has a mode setting that allows you to disable it.

K Mem for PS Heap

Also known as PS Heap, PostScript VM, and Virtual Memory, this client holds downloaded fonts, PostScript operators, and forms.

Inefficiently coded PostScript jobs can consume an infinite amount of virtual memory or leave objects in the PostScript heap after the print jobs are completed, leading to virtual memory errors. If not enough memory is allocated to the PS heap, the job cannot print.

Increasing the memory allocated to this client allows more complex jobs to print and increases the number of fonts that can be downloaded to virtual memory. However, this client should be increased only if you receive a virtual memory error when attempting to print a job or download a font and only in small increments until the error message goes away. Excess memory in the PS heap is not being used. The system will not allow you to set this memory client below its minimum setting. The range is 2048 to 12288 KB. The default value is 12288.

If you change the K Mem for PSHeap value, the printer automatically restarts after you save your change and exit from the menu.

K Mem PS Fonts

Also known as Font Cache and PostScript Font Cache, this memory client stores bitmapped representations of previously scaled Post-Script fonts. This process reduces the number of times a font must be converted from outline form to bitmap form. Printing pages that have characters already stored in the font cache is immensely faster than printing characters not yet in the font cache.

As the font cache memory fills, the printer erases bitmapped characters that have been in the cache longer than the others without being used to make room for new characters. By increasing the memory allocated to this client, the printer can store more characters and spend less time erasing and replacing characters in the cache.

Normally, you do not need to change this memory client unless you use a large number of fonts at various point sizes. If you do, you may allocate additional memory to this client to improve printer performance. There is no specific formula to use in figuring the amount of memory required by the font cache, but after a certain point, large font caches cause the printer to take longer to print than smaller font caches because of the search time through the cache.

The recommended font cache size is in the following range:

■   128 KB to 256 KB for 300 dpi printing

You should experiment to see what font cache size works best for you. The system will not allow you to set this memory client below its minimum setting. The range is 128 to 1024 KB. The default value is 01024. If you change the K Mem for PS Fonts value, the printer automatically restarts after you save your changes and exit from the configuration menu.

K Mem Emulation

The K Mem Emulation client is used to store any available non-Post-Script emulations, such as CCITT, imPRESS, Lineprinter, and HP-GL, PCL 5, or LN03 Plus. Increasing this client's memory allows more complicated non-PostScript jobs to print and allows optional emulations to process jobs.

If an emulation is loaded to process a print job and there is not enough memory in the emulation client, another emulation already loaded may be unloaded automatically to obtain enough memory. If you notice a delay in printing between jobs that have different non-resident emulations, it is possible that the emulations are having to reload each time they are run. Adding to the emulation client may eliminate the unloading and reloading of these emulations and, consequently, increase throughput.

Also, increase the emulation client if you are printing complex non-PostScript jobs that may require more memory to process correctly. The system will not allow you to set this memory client below its minimum setting. The range is 0 to 8192. The default value is 08192. If you change the K Mem for PS Fonts value, the printer automatically

restarts after you save your changes and exit from the configuration menu

K Mem Emul Temp

Also known as Emulation Temporary, this client sets the amount of system memory to be used by non-PostScript emulations for storing downloaded fonts, forms, and macros. By dedicating a portion of memory to this client, QMS Crown printers can perform context switching, which is the ability to retain downloaded fonts and forms even after the printer changes from one emulation to another. Context switching prevents unnecessary repetitive downloading and traffic congestion on networks.

Normally, this memory client does not need to be changed unless you plan to download many different non-PostScript fonts. The system will not allow you to set this memory client below its minimum setting. The range is 3584 to 6144 KB. The default value is 06144. If you change the K Mem for PS Fonts value, the printer automatically restarts after you save your changes and exit from the configuration menu

K Mem Display

The K Mem Display client is the excess memory client. The display list stores compressed representations, or blocks, of the pages to be printed. It takes approximately 1 compressed block for a normal 8½" x 11" text page, 4 compressed blocks for an 8 ½ " x 11" page that includes some graphics, and as many as 500 compressed blocks for an extremely complex page.

Many pages of compressed blocks belonging to multiple print jobs can be stored at the same time in the display list. If enough memory is allocated to this memory client, a page can always be ready to print as soon as another page has been imaged to the print engine. It takes approximately 32 KB of memory for each compressed block on the QMS 4525 Print System.

Increasing the amount of memory in this client may improve printing throughput and minimize slowdowns due to duplexing, collating, or printing complex pages. The system will not allow you to set this

memory client below its minimum setting. The range is 3072 to 307200 KB. The default value is 111056. If you change the K Mem for PS Fonts value, the printer automatically restarts after you save your changes and exit from the configuration menu

K Mem Disk Cache

Number of kilobytes of RAM dedicated to the disk cache. This memory client is also known as disk cache. It stores frequently used data in system memory instead of continually storing and retrieving it from a hard disk. If a hard disk is used and a lot of disk access is required, adding memory to the disk cache may increase the printer's performance. For example, if many fonts are stored on disk, faster access to these fonts is achieved by increasing the disk cache size. Conversely, if no hard disk is used, the disk cache should be set to zero until a hard disk is installed. However, when hard disks are installed they are not available until the disk cache client is increased. The range of possible values are 180 to 1016. The default value is 240. If you change the K Mem for PS Fonts value, the printer automatically restarts after you save your changes and exit from the configuration menu

The amount of memory needed for the disk cache client is dependent on the size of the disk, the number of disks, the number of subdirectories on each disk, the amount of memory dedicated to caching. As long as there is enough memory in the disk cache, all disks are accessible. If sufficient memory is allocated to the disk cache, some disks may be seen while others are not.

The recommended amount of memory for the disk cache client is as follows:

- 20 KB internal usage

- 0.5 KB per MB of disk storage total for all disks

- 100 KB cache blocks

For example, the recommended disk cache client size for a single 344 MB hard disk would be 180 KB.

» Note: The system will not allow you to set this memory client to less than the minimum number of MBs of printer memory. A value such as this is reasonable if hard disks are not being used, because the printer reallocates this memory to other clients that need additional memory. However, the hard disks remain unavailable until this client's size is increased.

System Memory

Also listed as System Use on the status page, this non-configurable client is related to the amount of RAM that is used to run the printer's operating system. It is never increased or decreased. The system memory subtracted from the total amount of RAM identifies the amount of RAM available for all the other memory clients.

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8

Engine, Miscellaneous, and Disk Operations Menus

In This Chapter . . .

- Laser setup

- Fine tuning image alignment

- Selecting default paper

- Naming input bins

- Other miscellaneous options

- Hard disk operations

Engine Setup Menu

The options in the Engine Setup menu allow you to fine tune image alignment, select a default paper size, and name the input and output bins.

Administration / Engine Setup Menu

Laser Setup
Image Alignment
Inputbin 1 Name
Inputbin 2 Name
Toner Low Action
Manual Feed Timeout
Gamma Correction
Finisher Setup

Laser Setup

The Laser Setup menu allows you to adjust the laser beam's intensity to compensate for normal degradation of the master belt. It also allows you to print a test page.

Administration / Engine Setup/ Laser Setup Menu

Laser Intensity
Test Page

The laser beam affects the background shading of the printed page. The higher the laser beam intensity, the lighter the printed image. The lower the laser beam intensity, the darker the printed image.

The laser beam intensity is initially set by the QMS field engineer. You can reset the laser beam intensity whenever your prints become too light or too dark. If your prints are too light, set the laser beam intensity to a lower setting. If your prints are too dark, set the laser beam intensity to a higher setting.

» Note: If the master belt is worn out, resetting the laser beam intensity does not affect print quality.

The range of possible values for Laser Intensity is 0 to 56. The default value is 30. Use the following procedure to reset the laser beam intensity.

1   **From the Engine Setup menu, select the Laser Intensity option.**

2   **Select Intensity. The current intensity setting displays**

    ```
    LASER INTENSITY (0-56)  ENTER VALUE [XX]:
    ```

    in which *XX* **is the current setting.**

3   **Enter the new setting on control panel.**

4   **Press the Enter key to select the new setting.**

5   **Print a test page by selecting Test Page from the Laser Intensity menu. The range of possible values are none, simplex, and duplex. The default value is none.**

    None   Does not print a test page.

    Simplex   Prints a test page on one side of the page.

    Duplex   Prints a test page on both sides of the page.

»   *Note: While you are printing a test page, message displays are not affected.*

    On the test page are a horizontal bar of gray-scale boxes numbered 1 through 10, and a vertical bar of gray-scale boxes identified by A through J. The gray-scale boxes next to 1 and A should be barely visible, and there should be a difference in shading between boxes 9 and 10, and between boxes I and J.

6   **If the test page is too light (one or more boxes are blank), go back to step 3 and set Laser Intensity to a lower value. If the test page is too dark (if you can make no distinction between boxes I and J or 9 and 10), go back to step 3 and increase the laser beam intensity setting to a higher value.**

7   When the test page is satisfactory, save your changes and place the printer on line.

Image Alignment

The Image Alignment menu allows you to adjust image alignment on each side of the page and then run a test page from each input bin.

To check the alignment of the image on the page, print a test page and measure the distance from the center of the cross hairs (in the center of the page) to the left and bottom edges of the paper. The center of the cross hairs should be in the exact center of the page. If it is not, use the Image Alignment menu's Front Side and Back Side options to adjust the image position on both sides of the page and then use the Test Page option to check your adjustments.

Front Side

Menu	Administration/Engine Setup/Image Alignment/Front Side
Range	0 to 350
Default	100 (0.33")
Notes	Vertical Offset—Adjusting the vertical offset moves the center of the image up or down in pixel ($1/300$") increments. Changing the setting to a lower value moves the image up, and changing it to a higher value moves the image down.
	Horizontal Offset—Adjusting the horizontal offset moves the center of the image to the left or right in pixel ($1/300$") increments. Changing the setting to a lower value moves the image to the left, and changing it to a higher value moves the image to the right.

Back Side

Menu	Administration/Engine Setup/Image Alignment/Back Side
Range	0 to 350

Default	100 (0.00")
Notes	Vertical Offset—Adjusting the vertical offset moves the center of the image up or down in pixel ($1/300$") increments. Changing the setting to a lower value moves the image up, and changing it to a higher value moves the image down.
	Horizontal Offset—Adjusting the horizontal offset moves the center of the image to the left or right in pixel ($1/300$") increments. Changing the setting to a lower value moves the image to the left, and changing it to a higher value moves the image to the right.

Test Page

There are three test page options which enable you to adjust for minor variations in the input bins and the duplex system:

Menu	Administration/Engine Setup/Image Alignment/Test Page
Range	None, Upper, Lower, Duplex
	None—Does not print a test page.
	Upper—Draws paper from the upper inputbin and prints a test page on one side of the sheet.
	Lower—Draws paper from the lower inputbin and prints a test page on one side of the sheet.
	Duplex—Draws paper from the default inputbin and prints a test page on both sides of the sheet.
Default	None

InputBin 1 Name

Use this option to assign a name to inputbin 1 (lower inputbin). For example, you may want to load the bin with pre-punched paper and assign it the name "3hole." Once you have assigned a name, users connected to the printer can use QMS DOC commands to select the inputbin "3hole" if they want their job printed on pre-punched paper. The names are not case sensitive.

The names for the bin may be up to 16 characters long. The default name for inputbin 1 is "Lower."

InputBin 2 Name

Use this option to assign a name to inputbin 2 (upper input bin). For example, you may want to load the bin with letterhead paper and assign it the name "letterhead." Once you have assigned a name, users connected to the printer can use QMS DOC commands to select the inputbin "letterhead" if they want their job printed on letterhead paper. The names are not case sensitive.

The names for the bin may be up to 16 characters long. The default name for inputbin 2 is "Upper."

Toner Low Action

The Toner Low Action menu options determine printer action when a low toner condition is detected. The options are Stop and Continue. The default is Continue.

Manual Feed Timeout

The Manual Feed Timeout option sets the number of seconds that the printer waits for a sheet of print media to be inserted into the manual feed slot. The range is 0 to 300 seconds, and the default is 30 seconds. A setting of 0 causes paper to be drawn from one of the input bins. The printer looks for paper first in the lower input bin and then the upper input bin.

Gamma Correction

This option enables or disables gamma correction. Gamma correction is the compression or expansion of the ranges of dark or light shades in a printed image to provide the best copy of scanned images. Often in scanned images, gray scaling may be too light or dark to show details clearly. Using gamma correction on a gray-scale image is similar to using a graphic equalizer on a home stereo; the range of gray levels is adjusted for the best possible image. This linearizes overall

midrandge contrast while blacks (shadows) and whites (highlight)
keep their original values.

Menu	Administration/Engine Setup/Image Alignment/Gamma Correction
Range	0, 1
	0—(Off) Do not apply gamma correction.
	1—(On) Apply gamma correction.
Default	0
Notes	Gamma correction works only for PostScript images.

Sorter Setup

The Sorter Setup menu appears only if your printer has a 20-bin or
40-bin sorter installed. Refer to chapter 9, "Using the Sorter," for infor-
mation on configuring and using the Sorter.

Finisher Setup

The Finisher Setup menu appears in the menu system only if your
printer has a stacker/stapler installed. Refer to chapter 10, "Using the
Stacker/Stapler," for information on using the stacker/stapler and
refilling the staples.

Miscellaneous Menu

The options in the Miscellaneous menu of the Administration menu
allow you to restore the factory default values for all configuration
options, set or adjust the printer system's clock, and set the printer
name and printer type.

Administration /Miscellaneous Menu

Restore Defaults
Clock Operations

> Printer Name
> Printer Type

Restore Defaults

The Restore Defaults option allows you to reset all configurable values to their factory default. This option takes effect immediately. The range of possible choices are Yes and No, with No being the default.

Clock Operations

The Clock Operations menu sets or adjusts the printer system's clock. The range of possible values are Set Clock or Adjust Clock.

Set Clock

The Set Clock option changes the date and time of the printer system clock. This date and time are recorded for each file printed on the 4525 Print System; It is listed on reports such as the status page, start-up page, header and trailer pages, and other print system reports. The Set Clock values have been pre-set at the factory.

Date   Specifies the day of the day, date, month, and year.

DDD dd mmm yyyy hh:mm:ss

DDD
Specifies the day of the week. The choices are SUN (Sunday), MON (Monday), TUE (Tuesday), WED (Wednesday), THU (Thursday), FRI (Friday), and SAT (Saturday).

dd
Specifies the date of the month. The choices are 1 to 31.

mmm
Specifies the month of the year. The choices are 1 to 12. The clock is programmed to change months correctly.

YYYY
Specifies the year. The clock is programmed to change
years correctly.

Time   *hh*
Specifies the hours. The choices are 0 to 23. The default is
the current hour.

mm
Specifies the minutes. The choices are 0 to 59. The default
is the current minutes.

The time is a numeric value. The hour specifies the hour in 12-hour
clock time. The seconds are display only. If you need to adjust the
seconds use the Adjust Clock option to adjust them on a monthly
basis. If you enter the day, date, month, year, hour, or minutes in the
wrong format, a CLOCK NOT SET error displays. If you enter an
invalid time, an INCORRECT ENTRY error displays

To set the clock from the console, type the new date and time in the
format described in the previous section. To set the clock from the
control panel, use the Previous and Next keys to select the correct
clock values, (i.e, date, day, month, hour, or minutes), then press the
Enter key to enter the clock value and advance to the next field.

Adjust Clock

Adjust Clock adjusts the clock by a set amount of time on a monthly
basis to account for a slow or fast clock speed. To adjust the clock, select
the number of seconds per month to automatically adjust the clock when
you notice it consistently running faster or slower than real time. The
range of possible values is +155 to -155 seconds per month (In 5 second
increments). The default value is 0 seconds per month.

Select the seconds per month value that matches or most closely
matches the clock speed. For example, if the clock is 90 seconds slower
than the real time on a monthly basis, select + 90 sec/month. This makes
the clock tick faster to correct the slow clock speed problem.

Printer Name

The Printer Name assigns a name to the printer. This option is an alphanumeric string of 31 characters maximum. The default value is QMS 4525 Print System.

Printer Type

Use the Printer Type option to indicate the printer type on an AppleTalk network. For example, set the printer type to "LaserWriter" if you have Macintosh computers on your network. Or, you can specify a different printer type if you want to hide the printer from Macintosh computers.

Disk Operations Menu

The options in the Disk Operations menu allow you to perform file operations on the printer's internal hard disk and any attached external hard disks. The QMS 4525 Print System is equipped with a SCSI-2 bus and a 344 MB internal SCSI hard disk. You can add up to six optional external hard disks to increase the job spooling capacity of the printer and provide space for permanent downloading of fonts and user file storage.

» Note: Always turn on any external hard disks prior to turning on the printer. When the printer is first turned on, it looks at the SCSI chain to determine which addresses are active. If a device on the chain is not turned on, the printer does not see it.

Administration / Disk Operations Menu

Install Option
Remove Option
Format Disk
Backup Hard Disk
Restore Disk

Identifying Hard Disks

The hard disks are identified by their device numbers. Your printer
has an internal hard disk with a device number of DSK6 and a printer
controller with a device number of DSK7. As shown below, if you have
optional external hard disks attached to the printer SCSI-2 port, their
device numbers can range from DSK0 to DSK5. Device numbers of
external disks are configured by the installer.

DSK6

External Disks
(DSK0 Through DSK5)
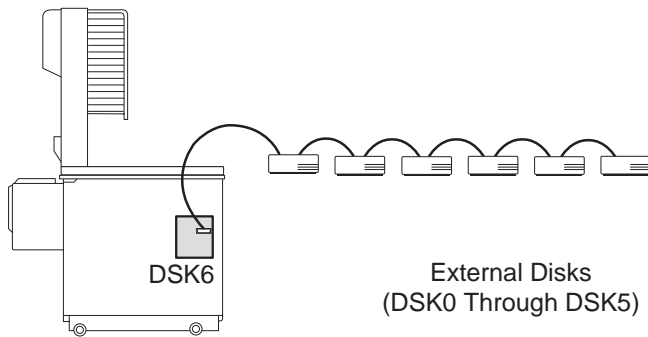
»   Note: If the internal hard disk is removed or an external hard disk is not
turned on, the printer does not reset non-volatile RAM to the factory
defaults.

Installing an Option

Options are usually supplied on 3.5" 1.44 MB disks. (See your QMS
vendor for information on any available options.) Installing an option
requires copying the contents of the disks to the printer's internal hard
disk or one of the printer's external hard disks. Use the Install Option
option on the Disk Operations menu.

**1   To install an option, place the printer off line and use the
control panel to display**

```
ADMINISTRATION      DISK OPERATIONS
```

in the message display.

---

2   Open the side panel to access the floppy disk drive.

On/Off Switch ——————————
Indicator Light ——————————
Floppy Disk Drive ——————————

Fan ——————————

Side Panel Door ——————————
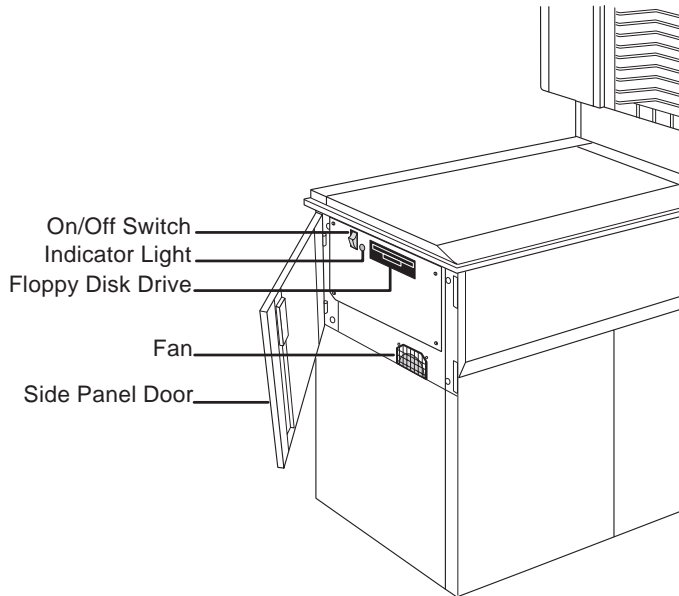
3   Press the Enter key to access the Disk Operations menu. Press the Next key until

`INSTALL OPTION`

displays in the second field of the message display.

4   Press the Enter key again to install an option.

5   Press the Next key until the address of the target disk (the destination of the option) displays in the second field of the message display (for example, DSK5).

6   Press the Enter key to select the address. The display prompts you to insert the disk containing the option in the floppy disk drive.

7 The message

```
READING DATA
```

displays until the contents of the disk have been copied to the hard disk. When the copy process finishes, the message

```
INSTALL COMPLETE
```

displays. Press the Back key to return to Install Option.

8 Press the Line key to ready the printer for receiving data from the host.

Removing an Option

Use Remove Option if you need to remove an installed option from the printer's hard disk. To remove an option, you need the original 3.5" disk containing the option files. (The Remove Option compares the contents of the disk with the contents of the hard disk. Matching files are then deleted from the hard disk.)

1 To remove an option, place the printer off line and use the control panel to display

```
ADMINISTRATION          DISK OPERATIONS
```

in the message display.

2 Open the side panel to access the floppy disk drive. (See the illustration in the "Installing an Option" section above.)

3 Press the Enter key to enter the Disk Operations menu. Press the Next key until

```
REMOVE OPTION
```

displays in the second field of the message display.

4 Press the Enter key again to select Remove Option. Press the Next key until the address of the hard disk containing the option displays in the second field of the message display.

5 Press the Select key to select the option's disk address. The display prompts you to insert a disk (the disk containing the original option) in the floppy disk drive.

6   The message

READING DATA

displays until the matching files on the hard disk have been deleted. When the removal process finishes, the message

REMOVE COMPLETE

displays. Press the Back key to return to the Remove Option selection.

7   Press the Line key to place the printer on line.

Formatting a Disk

Use the Format Disk selection to perform a DOS format of a 3.5" 1.44 MB disk. You may also use this selection to format the printer's internal hard disk and any external hard disks.

☞ **Caution:** Reformatting internal or external hard disks erases all contents of the disk.

1   To format a disk, place the printer off line and use the control panel to display

ADMINISTRATION   DISK OPERATIONS

in the message display.

2   If you are going to format a 3.5" disk, open the side panel (see illustration in the "Installing an Option" section above) to access the floppy disk drive, and insert the disk.

3   Press the Enter key. Press the Next key until

FORMAT DISK

displays in the second field of the message display.

4   Press the Enter key again. Press the Next key or Previous key until the address of the disk to be formatted displays in the second field of the message display. (The floppy is FLP0,

the internal hard disk is DSK6, and external hard disks are
DSK0-DSK5).

5   Press the Enter key. The message ARE YOU SURE? displays.
     If you are sure you want to format the disk, press the Enter
     key again.

     If you decide that you do not want to format the selected disk,
     press the Back key. This takes you back to step 2, where you can
     select a different disk to format or you can exit by pressing the
     Line key.

6   If you press the Enter key the second time in step 5 to format
     the disk, the message FORMATTING displays.

7   When the format process finishes, the message FORMAT
     COMPLETE displays. Press the Back key to return to the For-
     mat Disk selection. Press the Line key to ready the printer for
     receiving data from the host. If you formatted a hard disk, the
     printer automatically reboots.

Backing Up a Hard Disk

As with any computer, a good habit to acquire with your printer is per-
forming regularly scheduled hard disk backups. Use the Backup Hard
Disk selection in the Disk Operations menu to perform a full backup
(all files stored on a hard disk) or an incremental backup (only files
dated after the last previous backup).

»   Note: The printer's floppy disk requires a 3.5" 1.44 MB disk. You usually only
    need to back up when data other than the system data has been stored or
    modified on the printer's hard disk. Backing up the printer hard disk takes
    time and patience since it is a lengthy process. For example, a full backup of
    a 344 MB internal hard disk requires at least 239 3.5" 1.44 MB floppy
    disks.

1   To format a disk, place the printer off line and use the control
     panel to display

     ADMINISTRATION   DISK OPERATIONS

     in the message display.

---

2   Open the side panel (see illustration in the "Installing an Option" section above) to access the floppy disk drive.

3   Press the Next key until

`BACKUP HARD DISK`

displays in the second field of the message display.

4   Press the Enter key again. Press the Next key until the address of the hard disk you want to back up displays in the second field of the message display.

5   Press the Enter key. Press the Next or Previous key to choose between `FULL` **or** `INCREMENTAL` **back up.**

6   Press the Enter key again. The display prompts you to insert a floppy disk (a blank disk if you are performing a full back up or your last back-up disk if you are performing an incremental backup) in the disk drive.

7   Press the Enter key to begin backing up the hard disk. The message

`COPYING DATA`

displays. If the backup requires more than one floppy disk, the message display prompts you to insert another disk.

❧ **Caution:** Be sure to number the disks because backing up requires you to use them in sequence.

»   Note: If the back-up disk has not been formatted when the backup begins, the printer automatically formats it. If the disk is not empty, the message

    `FLOPPY NOT EMPTY`

displays. If the disk has been write-protected, the message

    `WRITE PROTECT`

displays. Remove the disk, slide the write-protect tab down, replace the disk in the drive, and start over at step 2.

**8   When the contents of the hard disk have been backed up, the
       message**

```
BACKUP COMPLETE
```

**displays. Press the Back key to return to the Backup Hard
Disk selection. Press the Line key to ready the printer for
receiving data from the host.**

Restoring the Hard Disk

Use your back-up disks to restore the contents of the hard disk in the
event of a hard disk failure.

**1   To restore a hard disk, place the printer off line and use the
       control panel to access Disk Operations. The**

```
ADMINISTRATION              DISK OPERATIONS
```

message display.

**2   Open the side panel (see the illustration in the section on
       "Installing an Option" above) to access the floppy disk drive.**

**3   Press the Enter key to enter the Disk Operations menu.
       Press the Next key until**

```
RESTORE HARD DISK
```

displays in the second field of the message display.

**4   Press the Enter key again. Press the Next key until the
       address of the hard disk that you want to restore displays in
       the second field of the message display (for example, DSK6).**

**5   Press the Enter key. The display prompts you to insert a
       floppy disk (your back-up disk) in the floppy disk drive.**

»   Note: You must insert the back-up disks in sequence. If you insert a
     disk out of sequence, the message

```
SEQUENTIAL ERROR
```

displays. Remove the disk and insert the correct one to continue.

---

6 **Press the Enter key to begin restoring the hard disk. The message**

```
COPYING DATA
```

displays.

7 **If you have more than one back-up disk, repeat steps 4 through 6 for each disk. When the contents of the floppy disk have been copied to the hard disk, the message**

```
RESTORE COMPLETE
```

displays.

8 **Press the Back key to return to the Restore Hard Disk selection. Press the Line key to ready the printer for receiving data from the host.**

Control Panel–BootROM User Menu

The BootROM User Menu allows you to perform system functions such as loading the system and installing files from the floppy disk. After the printer is turned on, you can access this menu in one of the following ways:

■ By being automatically taken there when the BootROM detects an error while trying to boot the print system.

■ By pressing any key, during the 10 second waiting period that begins after the

```
QMS Softload x.x     Ready to boot
```

message displays to, to abort the auto boot process.

The following is the BootROM User menu that displays on the control panel:

BootROM User Menu

Boot System
Install to Disk
Format Disk
Restore Defaults
Backup Disk

Boot System Menu

This menu allows you to boot the motherboard system image.

Boot System Menu

Hard Disk
Parallel
Diskette

Use the Previous or Next key to advance through the options. Use the Enter key to select booting from any of these options and set the new defaults. The default option is stored in NOVRAM.

Boot System from the Hard Disk

Use the Hard Disk option to boot the system image from the hard disk.

1   To boot the system from the Hard disk, wait until after the BootROM User menu displays, and press the Previous or Next key until the following displays in the message window:

```
QMS Softload x.x        Boot System
```

2   Press the Select key to access the Boot System menu and then press the Previous or Next key to display:

```
Boot System             Hard Disk
```

3   For this procedure, assume that the print system has hard disk 3, 5, and 6 configured, and hard disk 6 is the default

---

value which can be in Novram. Press the Enter key and the following displays:

```
Boot System              Hard Disk 6
```

4   Press the Next key, and the following displays:

```
Boot System              Hard Disk 3
```

For this example we are using hard disk 3. Press the Enter key to activate booting. The system begins loading, and the following message displays:

```
Boot System              booting   /
```

5   At this point, DO NOT TOUCH ANY KEYS until the system has completed loading. The slash bar on the right end keeps rotating until the download is completed. As soon as downloading is done, the BootROM give the CPU to the downloaded image immediately. When the system rebooting and printer initialization is complete, the following message displays:

```
IDLE
```

»   Note: If you do touch some keys during this step, you must go back to step 1 and start from there again.

Boot System from the Parallel Port

Use the Parallel option to boot the system image from the Parallel port.

1   **To boot the system from the parallel port, wait until after the BootROM User menu displays, and press the Previous or Next key until the following displays in the message window:**

```
QMS Softload x.x        Boot System
```

2   **Press the Enter key to access the Boot System menu and then press the Previous or Next key to display:**

```
Boot System             Parallel
```

3   **Press the Enter key to activate booting, and the following message displays:**

```
Boot System             Connecting.....
```

4   **Run fstpio on the host to send the system image. When the host is connected and the first data packet (which has image validation) is received, the following displays:**

```
Boot System             booting    /
```

5   **At this point, DO NOT TOUCH ANY KEYS until the system has completed loading. The slash bar on the right end keeps rotating until the download is completed. As soon as downloading is done, the BootROM give the CPU to the downloaded image immediately. When the system rebooting and printer initialization is complete, the following message displays:**

```
IDLE
```

»   Note: If you touch a key during this step, you must start again at step 1.

Boot System from Diskette

Use the Diskette option to boot the system image from floppy diskette.

»   Note: For a multiple diskette image, a message such as `Insert disk2` is displayed whenever another diskette is needed. You must replace the diskette in the drive with the appropriate diskette numbered on the display and press the Enter key to continue.

**1   To boot the system from diskette, wait until after the
     BootROM User menu displays, and press the Previous or
     Next key until the following displays in the message window:**

```
QMS Softload x.x        Boot System
```

**2   Press the Enter key to access the Boot System menu and
     then press the Previous or Next key to display:**

```
Boot System             Diskette
```

3   Press the Enter key, and the following displays:

```
Boot System             Insert disk1
```

**4   Press the Select key to activate booting. The system begins
     loading and the following displays:**

```
Boot System             booting   /
```

**5   At this point, DO NOT TOUCH ANY KEYS until the system
     has completed loading on diskette 1. The slash bar on the
     right end keeps rotating until the download is completed.**

**6   Remove disk1 and insert disk2. Then press the Enter key to
     continue booting. The system continues loading and the fol-
     lowing displays:**

```
Boot System             booting   /
```

**This process repeats until the last diskette is finished load-
ing. As soon as the complete downloading process is done,
the BootROM gives the CPU to the downloaded image imme-
diately. When the system rebooting and printer initialization
is complete, the following message displays:**

```
IDLE
```

» Note: If you touch a key during the rebooting process, you must go back
   to step 1.

Install to Disk

Use the Install to Disk option to copy files from diskette or the parallel port to hard disk. A new image is installed to disk only when image validation is done.

Install to Disk menu

Diskette
Parallel

Install to Disk via Diskette

Use the Diskette option to install a floppy diskette to the hard disk using the following procedure:

1   **After the BootROM User menu displays, press the Previous or Next key until the following displays in the message window:**

    ```
    QMS Softload x.x        Install To Disk
    ```

2   **Press the Enter key to access the Install to Disk menu and the following displays:**

    ```
    Install To Disk         Diskette
    ```

3   **Press the Enter key to install the files from the diskette to the hard disk. The following message displays**

    ```
    Install To Disk         Target Disk 6
    ```

4   **Disk 6 is the printer's internal hard disk. Press the Previous or Next keys to display other disks or press the Enter key to select hard disk 6 as the target.**

5   **Open the printer's left-side door to access the floppy disk drive. (See the illustration in the section on "Installing an Option" earlier in this chapter.)**

6 **Insert the first diskette into the floppy disk drive, and then press the Enter key. When BootROM is done with the diskette, it prompts for the next diskette by displaying**

```
Install to Disk         Next Diskette
```

7 **To continue, place the next diskette in the disk drive and press the Enter key. This process continues until all the diskettes have been loaded. Remember, press the Enter key after inserting each diskette.**

8 **When you have completed installing the files from the diskette to the hard disk, press the Back key and the following message displays:**

```
QMS Softload x.x        Install to Disk
```

9 **You are now ready to boot the print system. Press the Previous or Next key until the message window displays:**

```
QMS Softload x.x        Boot System
```

Then press the Enter key, and press the Previous or Next to display

```
Boot System             Hard Disk
```

10 **Press the Enter key and the following displays:**

```
Boot System             Hard Disk 6
```

Assume that Hard disk 6 is the print system's internal hard disk. If you have any external hard disks connected you can cycle through them by pressing the Next key. For this example we are using the internal hard disk. Press the Enter key. The system begins loading, and the following message displays:

```
Boot System             booting  /
```

11 **At this point, DO NOT TOUCH ANY KEYS until the system has completed loading. The slash bar on the right end keeps rotating until the download is completed. As soon as downloading is done, the BootROM gives the CPU to the downloaded**

**image immediately. When the system rebooting and printer
initialization is complete, the following message displays:**

```
IDLE
```

» Note: If you touch a key during this step, you must go back to step 9.

Installing From the Parallel Port

To copy a file from the parallel port to the hard disk via the parallel
port, follow these instructions:

**1   After the BootROM User menu displays, press the Previous
or Next key until the following message displays**

```
QMS Softload x.x          Install To Disk
```

**2   Press the Enter key to access the Install to Disk menu. and
the following displays**

```
Install to Disk          Diskette
```

3   Press Next key until the following message displays:

```
Install To Disk          Parallel
```

Then press the Enter key to display

```
Install To Disk          Target Disk 6
```

**4   Disk 6 is the printer's internal hard disk. Press the Enter key.
The following message displays:**

```
Install To Disk          Connecting....
```

**5   Go to your host system and run fstpio to send the file. When-
ever the file is received, the following message displays:**

```
Install To Disk          AFILE.TXT   /
```

**(`AFILE.TXT` is the current filename.) When all files have
been sent, the following displays:**

```
Install To Disk          Complete
```

Engine, Miscellaneous, and Disk Operations Menus   8-25

» Note: The operation is aborted whenever an error occurs, and the
following displays

```
Install To Disk          E20 disk full
```

» Note: E20 disk full is an error number. See "BootROM Error Messages,"
later in this chapter, for more information.

**6 You have now completed copying the files via the parallel
port and are ready to boot the system. Press the Back key.
The message window displays the following message:**

```
QMS Softload x.x         Install To Disk
```

**7 Press the Previous or Next key until the message window
displays:**

```
Boot System              Hard Disk
```

8 Press the Enter key and the following displays:

```
Boot System              Hard Disk 6
```

**Assume that Hard disk 6 is the print system's internal hard
disk. If you have any external hard disks connected you can
cycle through them by pressing the Next key. For this exam-
ple we are using the internal hard disk. Press the Enter key.
The system begins loading, and the following message dis-
plays:**

```
Boot System              booting  /
```

**9 At this point, DO NOT TOUCH ANY KEYS until the system
has completed loading. The slash bar on the right end keeps
rotating until the download is completed. As soon as down-
loading is done, the BootROM gives the CPU to the down-
loaded image immediately. When the system rebooting and
printer initialization is complete, the following message dis-
plays:**

```
IDLE
```

» Note: If you touch a key during this step, return to step 6.

Format Disk

Use the Format Disk option to format a DOS 3.5" 1.44 MB floppy disk,
the printer's hard disk, or any external hard disks.

Format Disk Menu

Hard Disk 1
Hard Disk 2
Hard Disk 3
Hard Disk 4
Hard Disk 5
Hard Disk 6
Diskette

☞ **Caution**: Reformatting internal or external hard disks erases all contents of
the disk.

---

1   **To format a disk, wait until after the BootROM User menu dis-
    plays, and press the Previous or Next key until the following
    message displays**

    `QMS Softload x.x        Format Disk`

2   **Press the Enter key to access the Format Disk menu. and the
    following displays**

    `Format Disk             Hard Disk 1`

3   **Press the Previous or Next key until the following message
    displays:**

    `Format Disk             Hard Disk 6`

»   Note: If you want to format a floppy or the internal or external hard
    disks, press the Previous or Next key until the address of the disk to be
    formatted displays in the message window. (The floppy is Diskette, the
    internal hard disk is Hard Disk 6, and the external hard disks are Hard
    Disk 1 to Hard Disk 5.) If you are going to format a floppy disk, display
    the Diskette option, and open the side panel (see the illustration in the
    section on "Installing an Option," earlier in this chapter) to access the
    floppy disk drive, and insert the disk.

Engine, Miscellaneous, and Disk Operations Menus   8-27

4 **Press the Enter key to format the disk. The following mes-
sage displays:**

```
Format Disk             Are you sure?
```

**If you are sure you want to format the disk, press the Enter
key again. If you decide that you do not want to format the
selected disk, press the Enter key. This takes you back to
where you can select another disk to format (step 2).**

5 **If you press the Enter key the second time in step 4 to for-
mat the disk, the message**

```
Format Disk             Formatting
```

displays.

6 **When the format process finishes, the message**

```
Format Disk             Format Complete
```

**displays. Press the Back key to return to the Format Disk
option. The printer automatically reboots the print system
when the internal hard disk is formatted.**

Restore Defaults

Use the Restore Defaults option to reset NOVRAM settings when
they become corrupted.

Backup Disk

Use the Backup Disk option to back up hard disk 6 in QMS back-up
format.

Backup Disk Menu

All
User-files only

» Note: If the backup requires more than one floppy disk, the message display prompts you to insert another disk. Be sure to number the disks because backing up requires you use the disks in sequence. If the back up disk has not been formatted when the backup begins, the print system automatically formats the unformatted disk.

All	Does a full backup of hard disk 6 in QMS back-up format. This backup includes user files and system files, from the hard disk onto floppy disk(s). This command is only necessary if the original system diskettes have been destroyed. This backup takes approximately 2 hours and may require a large number of disks.
User-files Only	Backs up all user files from the hard disk to floppy disk(s). All files in the DSK6:/USR directory are backed up. This selection can be used by the system administrator to safeguard user files.

BootROM Error Messages

The following are error messages that may display when you are using the functions of the Softloader. These error messages display with a leading error number. To confirm the message press the Back key, and you are returned to the menu selection.

Error Message	Meaning
E01 System Error	Resource locked
E02 System Error	Resource not locked
E03 System Error	Bad file ID
E04 System Error	No current working directory
EO5 File Protect	Write to read only or read from write only file
E06 System Error	No available fds, too many open files
E07 System Error	Unknown device name
E08 System Error	Invalid mode
E09 System Error	Invalid process ID or name
E10 System Error	Process already active

E11 System Error	Serial line connection failure
E12 System Error	Serial line parity or other error
E13 System Error	I/O operation cannot be performed by device
E14 System Error	I/O error
E15 System Error	Invalid seek pointer
E16 System Error	Bad file name syntax
E17 System Error	Too many open file systems
E18 System Error	Too many open files for file system
E19 Dir Full	File system directory full
E20 Disk Full	File system full; no data space
E21 File Unfound	File does not exist
E22 System Error	File name too long
E23 System Error	Device or file system is busy
E24 System Error	File to be created or removed already open
E25 System Error	File subsystem superblock is invalid
E26 System Error	Invalid directory
E27 System Error	Timeout on read
E28 System Error	Cannot create or remove file system directory file (*name*)
E29 System Error	Non-cached disk access not a block boundary or not integral blocks
E30 System Error	Option not present
E31 System Error	Illegal parameter value
E32 System Error	Illegal use of opendv
E33 System Error	File cannot be opened for write
E34 System Error	Required memory cannot be allocated
E35 No Diskette	No diskette in floppy drive
E49 System Error	Undefined error
E50 Load Error	Unknown load command %d
E51 Load Error	Loading error
E52 Load Error	Non-system file

E53 Load Error	Can't load segment or set entry point to odd address
E54 System Error	Open error. Insert diskette %d and press the Select key to retry or the Menu key to quit.
E55 System Error	Read error. Press the Select key to retry or the Menu key to quit.
E56 System Error	Write error. Press the Select key to retry or the Menu key to quit.
E57 Cksum Error	Image Checksum
E58 Version Err	Image Compatibility
E59 Version Err	Image system type
E60 Data Error	Image data format
E61 System Error	Open error: LPT0
E62 System Error	Initialization error: LPT0
E63 System Error	Create SYSTEM.DL error
E64 Internal	Any softload internal error
E65 Retry Error	Read retry error
E66 Seqnum Error	Image file: seqnum error
E67 System Type	Image file: system type error
E68 Image Type	Image file: image type error
E69 File Name	Image file: filename error
E70 File Attr	Image file: file attribute error
E71 Image Format	Image file: image format error
E72 Processor	Image file: processor type error
E73 Endian	Image file: endian error
E74 Compatible	Image file: compatibility error
E75 Compression	Image file: compression error
E76 Bad Header	Invalid header error
E77 Nvram Chksum	Checksum error on possible corrupted Nvram
E78 Disk Space	Not enough disk space before write
E79 Memory Space	Not enough memory space before downloading
E80 Backup Error	

Console—BootROM User Menu

The BootROM User Menu via the console provides a richer set of
system functions than the control panel menu and is intended for
QMS Field Engineering and QMS Technical Assurance staff. To get to
this menu, you must press a key on the console during the BootROM
initialization.

When the print system is turned on, the console (like the control
panel) displays BootROM internal diagnostic messages similar to the
following:

```
QMS Bootrom Version x.x
Copyright (c) 1992 QMS, Inc.


Power-on diagnostics in progress...
testing ROM CHECKSUM...
testing DRAM (press any key to abort)...
installing exception code...
testing CACHES...
testing TLB...
testing NOVRAM/TOD...
testing VIA...
testing ENGINE duart...
testing FLOPPY DISK controller
testing Z80 - Appletalk I/F...
testing HARD DISK controller...
testing PARALLEL port...
testing OPTIONAL I/O 1 board...
testing OPTIONAL I/O 2 board...
testing FLOATING-POINT UNIT...

QMS Bootrom Version x.x

DRAM size = 32768 Kb

CPU Subsystem:
CPU............PASSED
FPU............PASSED
```

```
Cache.........PASSED
TLB...........PASSED
I/O Subsystem:
Novram/TOD.....PASSED
VIA...........PASSED
I/O duart......PASSED
Engine duart...PASSED
FDC...........PASSED

Z80 I/F.......PASSED
SCSI..........PASSED
Parallel.......PASSED
Optional I/O 1.PASSED
Optional I/O 2.FAILED; error code = 0x020a0102
ROM checksum...PASSED

diagnostics complete, passing control to boot-
code...


Ready to autoload...
[Hit any key to interrupt]
```

At this point, you can press any key on the control panel to display the following BootROM User menu either on the control panel or on the console:

```
----QMS Bootrom User Menu----
1.    Load system
2.    Install/Restore diskette(s)
3.    Backup user files
4.    Back up all files
5.    Reinstall hard disk
6.    Copy hard disk to hard disk
7.    Invoke diagnostics
8.    Restore Defaults

Choose one [1]:
```

BootROM User Menu

The options on the BootROM user menu via the console allow you to perform system functions such as loading the system, installing files from the floppy disk, backing up the hard disk, formatting the hard disk, copying hard disk to hard disk, restoring defaults, and invoking diagnostics.

Load System

Prompts you for a loadable file on a hard disk. If the load file name is not specified, the default file will be used.

Install/Restore Diskette(s)

Copies files such as software upgrades, optional fonts, and user files from floppy disk(s) to a hard disk.

Back-up User Files

Backs up all files in the DSK6:/USR directory to floppy disk(s). This selection can be used by the system administrator to safeguard user files. This selection automatically formats unformatted floppy disks.

Back-up All Files

Back-up all files on DSK 6 in QMS back-up format, including user files and system files, from a hard disk onto floppy disk(s). This command is only necessary if the original system diskettes have been destroyed.

Reinstall Hard Disk

Formats hard disk and transfers the data on the floppy disk(s) to a hard disk. This selection can be used when a hard disk has been corrupted, or when major software upgrades significantly change the files on a hard disk (the upgrade notice will indicate the use of this option).

Copy Hard Disk to Hard Disk

Duplicates the contents of DSK5 to DSK 6. It reformats DSK6 to delete its contents. It is intended for use by QMS Field Engineering to allow them a fast method of installing a new system.

Invoke Diagnostics

Displays diagnostic menus that allow the QMS Field Engineer or QMS Technical Support staff to run hardware diagnostic tests. When this menu is selected a set of diagnostics are run and the following main diagnostics menu is displayed:

QMS Hardware Diagnostics Main Menu

1. Field Service Tests
2. Engineering Tests
3. Utilities
4. Reboot system

Enter selections (1-4):

❖

Console—
BootROM User
Menu

9

Using the Sorter

In This Chapter . . .

- Using the 20-bin sorter
- Using the 40-bin sorter

Introduction

If your QMS 4525 Print System was purchased with a sorter it has one of the following sorters:

- 20-bin sorter

- 40-bin sorter

The QMS 4525 Print System comes with either a 20-bin sorter or a 40-bin sorter, as shown below.
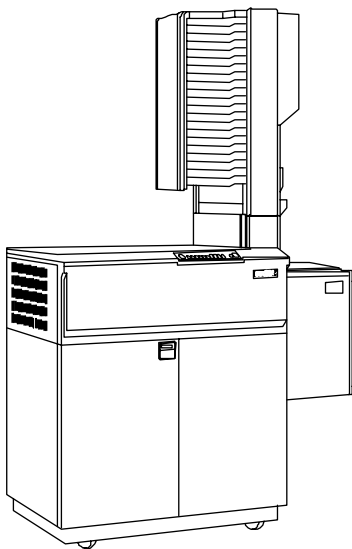
QMS 4525 with 20-Bin Sorter   QMS 4525 with 40-Bin Sorter
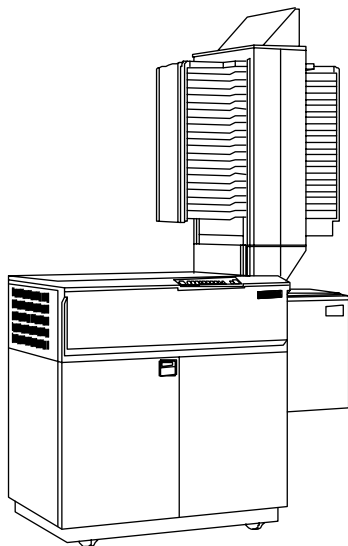
Using either of the sorters involves

- Configuring a sorter with the Sorter Setup menu.

- Specifying one of the sorter bins as the default output bin.

- Emptying sorter bins

These steps are described on the following pages.

Configuring a Sorter

Use the Sorter Setup menu to

- Set the maximum capacity of the sorter bins

- Select one of four default binmaps

- Modify the four default binmaps

The Sorter Setup menu appears under the Engine Setup menu only if your printer has a sorter installed.

Engine Setup / Sortup Setup Menu

Maximum Capacity
Choose Binmap
Modify Binmap

Maximum Capacity

The Maximum Capacity option sets the maximum capacity of all sorter bins. The range is 10 - 200 sheets although the actual capacity of the sorter bins depends on the weight of the paper you are using. All sorter bins have the same fixed capacity of 100 sheets of 16-27 pound (60-100 g/m^2) paper or 50 sheets of 27-53-pound paper (100-200 g/m^2). If you use a different weight paper, you must adjust the maximum capacity of your sorter bins accordingly.

Choose Binmap Menu

The organization and use of bin maps and bin map templates are difficult to describe, so let's break this section into more manageable pieces:

- The Choose Binmap menu gives you four binmaps to choose from. Just select the one you want to use.

- The binmap templates are listed in tables in the following sections. Binmap templates 1 through 4 are the factory default

templates for the four default binmaps. For example, Map # 1 is the default template for binmap 1. Map # 2 is the default template for binmap 2, and so on. If these templates suit all of your sorting needs, you need go no farther.

■ If none of the four templates meet your needs, you can assign any of the remaining templates 5 through 12 for a 20-bin sorter, or 5 through 21 for a 40-bin sorter, to any of the four binmaps. To do this, use the Binmap Templates option in the Modify Binmap menu described next.

In the table below, each binmap template is listed along with the number of logical bins that it contains, the physical bins that make up each logical bin, and a description of the binmap.

Default Bin Magging for 20-bin Sorter

Map#	Logical Bins #s	Physical Bins	Description
1	1 - 20	1	Each logical bin has 1 physical bin
2	1	20	One logical bin with 20 physical bins
3	1 - 10	2	Each logical bin has 2 physcial bins
4	1 - 5	4	Each logical bin has 4 physical bins
5	1 - 4	5	Each logical bin has 5 physical bins
6	1 - 2	10	Each logical bin has 10 physical bins
7	1	5	First logical bin has 5 physical bins
	2 - 16	1	Rest of logical bins have 1 physical bin
8	1	10	First logical bin has 10 physical bins
	2 - 11	1	Rest of logical bins have 1 physical bin
9	1	15	First logical bin has 15 physical bins
	2 - 6	1	Rest of logical bins have 1 physical bin
10	1 - 5	1	First 5 logical bins have 1 physical bins
	6	15	Last logical bin has 15 physical bins
11	1 - 10	1	First 10 logical bins have 1 physical bin
	11	10	Last logical bin has 10 physical bins
12	1 - 15	1	First 15 logical bins have 1 physical bin

Default Bin Mapping for 40-bin Sorter

Map#	Logical Bins #s	Physical Bins	Description
1	1 - 40	1	Each logical bin has 1 physical bin
2	1	40	One logical bin with 40 physical bins
3	1 - 20	2	Each logical bin has 2 physcial bins
4	1 - 10	4	Each logical bin has 4 physical bins
5	1 -8	5	Each logical bin has 5 physical bins
6	1 - 4	10	Each logical bin has 10 physical bins
7	1	5	First logical bin has 5 physical bins
	2 - 36	1	Rest of logical bins have 1 physical bin
8	1	10	First logical bin has 10 physical bins
	2 - 31	1	Rest of logical bins have 1 physical bin
9	1	15	First logical bin has 15 physical bins
	2 - 26	1	Rest of logical bins have 1 physical bin
10	1 - 5	1	First 5 logical bins have 1 physical bins
	6	35	Last logical bin has 35 physical bins
11	1 - 10	1	First 10 logical bins have 1 physical bin
	11	30	Last logical bin has 30 physical bins
12	1 - 15	1	First 15 logical bins have 1 physical bin
	16	25	Last logical bin has 25 physical bins
13	1 2	20	Each logical bin has 20 physical bins
14	1	20	First logical bin has 20 physical bins
	2 - 21	1	Rest of logical bins have 1 physical bin
15	1	25	First logical bin has 25 physical bins
	2 - 16	1	Rest of logical bins have 1 physical bin
16	1	30	First logical bin has 30 physical bins
	2 - 11	1	Rest of logical bins have 1 physical bin
17	1	35	First logical bin has 35 physical bins
	2 - 6	1	Rest of logical bins have 1 physical bin

Default Bin Mapping for 40-bin Sorter

Map#	Logical Bins #s	Physical Bins	Description
18	1 - 20	1	First 20 logical bins have 1 physical bin
	21	20	Last logical bin has 20 physical bins
18	1 - 20	1	First 20 logical bins have 1 physical bin
	21	20	Last logical bin has 20 physical bins
19	1 - 25	1	First 25 logical bins have 1 physical bin
	26	15	Last logical bin has 15 physical bins
20	1-30	1	First 30 logical bins have 1 physical bin

If none of these default binmaps meet your requirements, you can modify them as described in the next section.

Modify Binmap Menu

The Modify Binmap menu allows you to configure each of the four default binmaps to suit your particular printing requirements.

1   Enter the Modify Binmap menu from the Sorter Setup menu.

There are four options on this menu.

Sorter Setup / Modify Binmap

Binmap 1
Binmap 2
Binmap 3
Binmap 4

2   Select the binmap that you want to change.

This selection puts you in the Binmap menu which is described next.

About Logical and Physical Bins

All sorter bins (these are called "physical" bins) have the same fixed capacity depending on the weight of the paper you are using. Since

many print jobs will exceed the maximum capacity of each physical bin, additional bin capacity is often needed. To obtain larger bin capacity, you can combine two or more physical bins into a "logical" bin. This is called "bin mapping." For instance, if you routinely print reports that approach 500 pages in length and you use 20 lb paper, you can map five physical bins into a single logical bin that would hold the entire report.

Logical bins are defined by a number from 1 to 20 if you have a 20-bin sorter, or 1 to 40 if you have a 40-bin sorter. These numbers must be consecutive numbers in ascending order. A physical bin can be assigned to only one logical bin.

The 20 or 40-bins in your sorter are "physical" bins that have the same fixed capacity. Therefore, a lengthy print job would overflow these physical bins, making it impossible to properly sort the entire job. To solve this potential problem, all you have to do is think in terms of logical bins. Using the "bin mapping" feature, you simply define one or more physical bins to be a logical bin. With a 20-bin sorter, you can have as many as 20 logical bins (1 physical bin per each logical bin), or as few as 1 logical bin (20 physical bins per each logical bin).

The printer thinks it delivers paper only to logical bins. You have to tell it which physical bins make up each logical bin. To help you, there are four binmaps with binmap templates that will probably meet most of your needs. If you have different requirements, you can use the Bin-map menus, described below, to assign different binmap templates to any of the binmaps.

There are actually four identical binmap menus, one for each of the four binmaps. These menus allow you to

■ Enable/disable sorting across logical bin boundaries.

■ Enable/disable separation of documents on job or copy bound-aries.

■ Specify the action printer is to take if the next sorter bin is not empty.

■ Assign physical bins to logical bins.

■ Assign names to any of the logical bins.

■ Use binmap templates to select some of the most common physical to logical bin assignments.

Sorter Setup / Modify Binmap / Binmaps 1 Thru 4

Separation
Sort Mode
Next Bin Not Empty
Bin Groups
Logical Bin Names
Binmap Templates

Separation

Use the Separation option to enable or disable print job separation within a logical bin.

Separate Jobs

Each print job will be deposited in the next physical bin of a logical bin. When all physical bins within a logical bin are empty, the next print job is deposited starting in the lowest numbered physical bin of that logical bin.

Separate Copies

Each copy of a print job will be deposited in the next physical bin. When all physical bins within a logical bin are empty, the next print job is deposited starting in the lowest numbered physical bin of that logical bin.

Disabled

Disables separation within a logical bin.

Sort Mode

Use the Sort Mode option to enable or disable the sorting of print jobs across logical bin boundaries.

Local Sort

Multiple copies of a print job will be deposited within a single logical bin.

Global Sort

Each copy of a print job will be deposited in the next logical bin.

Next Bin Not Empty

If Job or Copy Separation is enabled, you can use the Next Bin Not Empty menu to cause the printer to deposit the next print job in the next bin even if the bin is not empty, or to wait for the next bin to be emptied before continuing to print.

Continue

The printer starts a new print job in the next bin whether the bin is empty or not.

Stop

The printer waits for the next bin to be emptied.

Bin Groups

The Bin Groups option assigns the physical sorter bins into groups called logical bins. If you have a sorter, you can divide all of the bins into logical bins by assigning each to either a "New Group" or to the "Last Group." For example, if you want to divide 20 bins into five logical bins, assign bin 1 to "New Group, " the next three bins to "Last Group," the next bin to "New Group," the next three bins to "Last Group," and so on.

Logical Bin Names

Use the Logical Bin Names opton to assign your own names to any of the logical bins. These are the bin names that are used in QMS DOC commands.

Binmap Templates

The Binmaps Templates option provides a shorthand method of setting bin groups. Binmap templates are used to assign physical sorter bins to logical bins.

Emptying Sorter Bins

The sorter automatically detects if a bin is empty and it counts the number of sheets deposited in a bin to determine when a bin is full. A bin holds a maximum of 100 sheets of 16-27 lb (60-100 g/m^2) paper or 50-sheets of 27-53 lb (100-200 g/m^2) paper . The default setting is 100 to allow for 16-27 lb (100-600 g/m^2) paper. If you use 27-53 lb (100-200 g/m^2) paper, in the upper input bin, the maximum bin level is automatically reduced to 50-sheets.

» Note: If the paper you are using seems to be causing frequent paper jams in the sorter, use the Maximum Capacity option in the Sorter Setup menu (in the Engine Setup menui) to reduce the maximum number of sheets allowed for a full bin. The range is 1 to 100.

When the maximum sorter bin level is reached, the printer stops and

```
OUTPUT BIN FULL
```

appears in the message display.

The message continues to display until you have removed **all** sheets from the bin. Then, printing automatically resumes.

If You Have Job or Copy Separation Enabled

Job Separation causes the printer to switch to the next physical bin within a logical bin group for the next print job. If the next bin is not empty (pages left from an earlier job, for instance), the OUTPUT BIN FULL message displays until you remove the paper.

Default Sorter Bin

Use the Outputbin option in the Operator Control menu to select the side outputbin or one of the sorter bins as the default outputbin. Remember that the sorter bins listed in this option are logical bins.

❖

Default Sorter Bin

10

Stacker/Stapler

In This Chapter . . .

- Stacker/Stapler operating modes
- Finisher setup menu

Introduction

If your printer is equipped with a stacker/stapler, use this chapter to

■ Set up and use the stacker/stapler

Here's how the QMS 4525 Print System looks with a stacker/stapler installed:
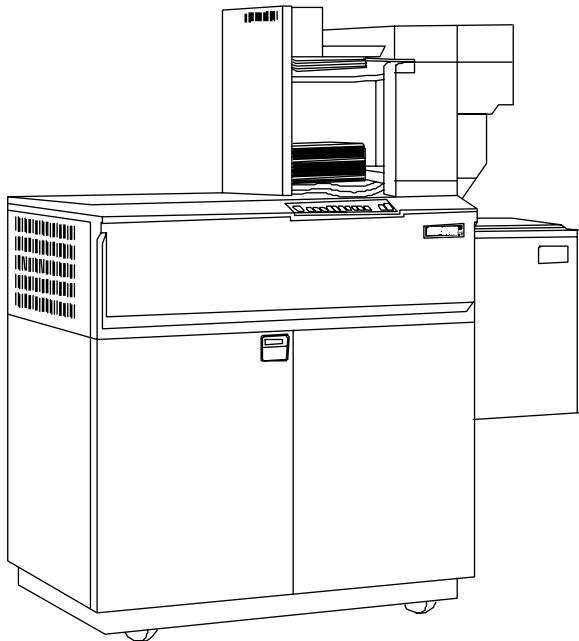
The stacker/stapler provides normal printed output, stapling, and offset stacking of print jobs. There is one internal batch tray and two output bins:

■ **Batch tray**
The internal batch tray (see illustration in "Bin Capacities" later in

this chapter) gathers output into batches of 35 sheets or less to
be stapled.

■ **Upper bin**
The upper bin receives stapled print jobs, offset-stacked print
jobs, and stapled offset print jobs. It also receives overflow when
the stacker bin is full. See "Emptying Output Bins" later in this
chapter.

■ **Stacker bin**
The stacker bin receives stapled or unstapled print jobs. Offset
stacking is also available. See "Bin Capacities" and "Emptying
Output Bins" later in this chapter.

Setting Up the Stacker/Stapler

Use the Finisher Setup menu to set the stacker/stapler operating
mode, bin capacities, and output bin names. Use the Stapling option
in the Operator Control menu to enable or disable stapling.

The Finisher Setup menu appears under the Engine Setup menu only
if your printer has a stacker/stapler installed. Use this menu to set the
stacker/stapler operating mode, maximum capacities of the batch tray
and the stacker bin, and the output bin names.

Administration / Engine Setup / Finisher Setup Menu

Mode
Bin Capacities
Output Bin Names
Offset Stacking
Stapling

Mode

Use the Mode option in the Finisher Setup menu to select the output
mode. Refer to "Offset Stacking" and "Using the Stapler," later in this
chapter, for information on selecting these features.

The stacker/stapler has three operating modes:

Separated
Stapled and unstapled print jobs are separated: all stapled jobs are deposited in the upper bin, and print jobs that are not stapled are deposited in the stacker bin.

Continuous
Continuous mode delivers stapled or unstapled print jobs to the stacker bin until it is full. Output then switches to the upper bin until it, too, is full. When both bins are full, OUTPUTBIN FULL displays and the printer stops and waits for the bins to be emptied.

Tray Selection
Tray selection mode uses the default output bin selected from the Operator Control menu, or the output bin specified for the current print job by an application, DOC command, or network print command. Any 16-character name is allowed. Factory defaults are "lower" and "upper." Tray selection can also be done by tray number. The valid tray numbers are 1 (lower) and 2 (upper).

Bin Capacities

The Stacker/Stapler has three output bins: An upper output bin, a stacker bin, and an internal batch bin. While the capacity of the upper output bin is fixed, the capacity of the internal batch tray and the stacker bin can be changed via the Bin Capacities option in the Finisher Setup menu. The printer determines when a bin is full by counting the number of sheets delivered to a bin since it was last emptied.

Batch
The batch tray is an intermediate destination in which sheets are col-

lected into batches of 35 sheets or less before being stapled and
stacked (see illustration) in the upper or lower output bins.

Internal Batch Tray
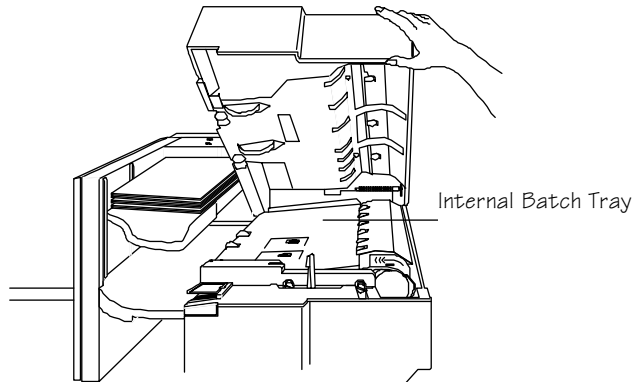
» Note: Stapling requires at least two sheets per print job. Therefore, batch
tray capacity must be set at two or more sheets for stapling to occur.

Normally, a maximum of 35 sheets of 30 lb. (80 g/m^2) paper can be
batched in the internal batch tray. If you regularly find sheets of paper
folded in the batch tray, you are probably using paper which easily
curls. To avoid this problem, either use paper which has less ten-
dency to curl, or reduce the maximum number of sheets that can be
batched in the tray.

» Note: When you load heavier paper in the input bins, the batch tray capacity
is automatically reduced to 25. In that case, you may not need to reduce
the maximum batch tray capacity.

Lower
Stacker bin capacity can be set to 500 or 1700 sheets. Normally, the
stacker bin is set to 1700, which accepts approximately 1700 sheets
of 30 lb. (80 g/m^2) paper. However, if the stacker mode is set to Con-
tinuous and you have enabled stapling, you should reduce the capac-
ity to 500 sheets. This is because stapled sets can be stacked only so
high before they start sliding off the stack. Use the Bin Capacities
option in the Finisher Setup menu to adjust the capacity of the lower
bin.

Output Bin Names

Use the Outputbin Name option in the Finisher Setup menu to name the stacker/stapler output bins. You can name the lower output bin and the upper output bin. The bin names can be up to 16 characters in length.

Offset Stacking

If your printer has a stacker/stapler installed, the Offset Stacking option enables or disables offset stacking. The default setting for Offset Stacking is On. When offset stacking is enabled, alternating copies or collated sets of copies are offset stacked 1.06" (27 mm). The following illustration shows offset stacking. See appendix E, the "Manual Updates" section, of this manual for additional information on offset stacking.
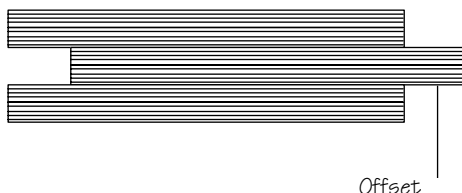
Offset

Stapling

The Stapling option enables or disables stapling. Sets of up to 35 sheets can be stapled. The default setting is Off.

See appendix E, the "Manual Updates" section, of this manual for more information on stapling.

❖

11

Printer-Host Connection

In This Chapter . . .

- Simultaneous Interface Operation (SIO)

- Emulation Sensing Processor (ESP) technology

- Connecting via the LocalTalk port

- Connecting via the parallel port

- Connecting via the serial port

- Local Console Connection

- External SCSI-2 Port

Introduction

An interface is the point at which two elements connect so they can work together. The printer-host communications interface is the way a printer connects to and works with a host (for example, a microcomputer, minicomputer, mainframe computer, or a network), and involves both hardware and software. The way your printer interfaces with a host depends on many things, including host type, host ports available, interface cabling, application software, printer languages and emulations, and printer drivers.

This chapter briefly explains your printer's Simultaneous Interface Operation (SIO) and Emulation Sensing Processor (ESP) technology. Both of these resident features enhance the printer-host interface. Then the chapter describes how to connect a host to the printer's LocalTalk, parallel, or serial port, and test communication.

» Note: If you have purchased a network interface for the printer, see the documentation that came with your network interface kit for connection information. Also see the QMS Crown Network Notes manual.

Simultaneous Interface Operation (SIO)

Simultaneous Interface Operation (SIO), a standard feature of the Crown architecture, enables your printer to communicate simultaneously with hosts through the LocalTalk, parallel, serial, and optional network interface ports. SIO allows you to have more than one host communicating with the printer simultaneously.

These ports are located on the interface panel on the back of the printer and are labeled (see illustration below).
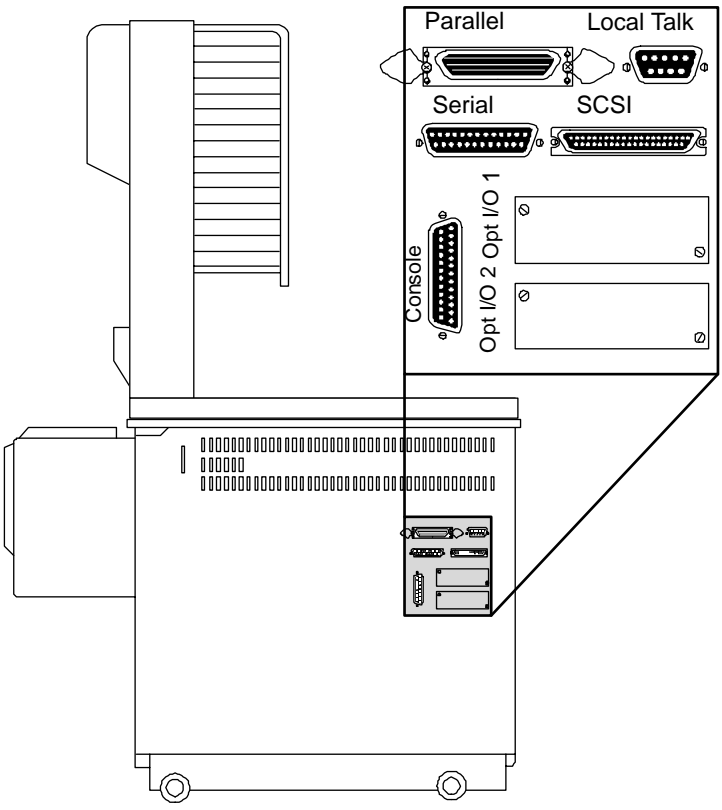
Emulation Sensing Processor (ESP)

ESP technology is another standard feature of Crown architecture. ESP technology, which works with most popular commercially available applications, uses a form of artificial intelligence to analyze incoming file data and select the appropriate printer emulation (for example, PostScript, PCL 5, imPRESS, or Lineprinter) from those installed on the printer.

The print job is processed without your having to change printer switch settings or send software commands to accommodate different printer emulations.

When your printer is in ESP mode, you can easily print files prepared for a PostScript, HP PCL 5, Lineprinter, or imPRESS printer. The file prints correctly as long as it begins with the usual commands for such items as page formats and job parameters (number of copies, page margins, fonts), whether you have one, two, or more host computer systems, and whether you are communicating through a serial, parallel, or LocalTalk interface.

Communication Modes

You can allow your printer to operate in its default PostScript mode, reconfigure its ports to accept jobs in only HP PCL 5 or another emulation, or reconfigure its ports for ESP mode.

If you do want to reconfigure the interface ports, the easiest way is to use the printer's control panel (the Administration/ Communications submenu) or the console. Configuring the printer through the control panel is described earlier in this manual and is outlined on the printer control panel guide. Configuring the printer from the console is described in the *Crown Remote Console User's Guide*.

Connecting via the LocalTalk Port

Connecting to the LocalTalk port involves

■ Assembling the proper interface cabling (use a LocalTalk-type kit such as Farallon's PhoneNET, available from your QMS vendor)

■ Making the connection

■ Making sure the necessary printing files are installed on the Macintosh

The LocalTalk port is used to print if

■ Your host is any member of the Apple Macintosh family. The instructions in this chapter explain how to connect a Macintosh to the printer.

■ Your host is an IBM PC or compatible microcomputer, workstation, mini computer, or mainframe computer that connects through a print network (such as TOPS or AppleShare) using LocalTalk-type connectors and boxes. If you are connecting to a host such as these, you may need additional hardware or software. See your host or network documentation for details specific to your setup.

Macintosh Interface Cabling

To connect your printer to a Macintosh (see illustration below), you must have two PhoneNET-type transformer boxes: one with a DB-9 connector for the printer port and one with a DIN-8 connector for the Macintosh port. You also need an RJ11 (telephone) cable and enough terminating resistors to close any open sockets left in the transformer boxes after the connection is made. (You need two termi-

---

nating resistors if you are connecting the printer to a single Macin-
tosh.)
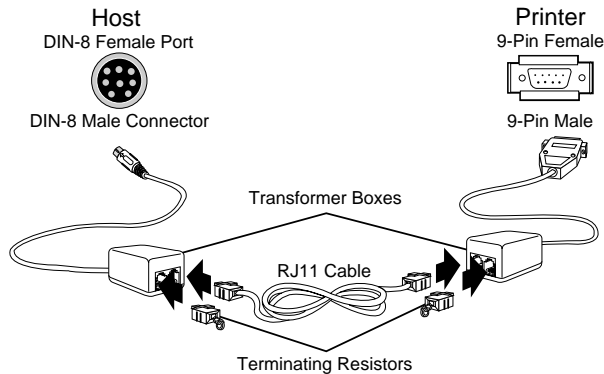
Your PhoneNET and Macintosh documentation contains further infor-
mation on AppleTalk networks and the proper termination of the
transformer boxes.

Making the Connection
Use the following procedure to connect your printer to the host.

✍ **Caution:** Turn off both the printer and the host before making the
connection.

1   **Connect the DB-9 connector from one transformer box to the
    printer's LocalTalk port.**

2   **Plug the DIN-8 connector from the other transformer box into
    the Macintosh port.**

3   **Plug one end of the RJ11 cable into the transformer box at
    the printer and the other end of the cable into the trans-
    former box at the host.**

4   **Insert terminating resistors into any open sockets in the con-
    nector boxes. This keeps the printer from falling off the
    Chooser.**

5   Turn on the printer.

Macintosh Printing Software

Once the Macintosh and printer are physically connected by the
LocalTalk cable, you must make sure the necessary printer software
files (for example, printer drivers and printer description files) are
installed on the Macintosh so it can communicate with the printer.

PS Executive Series Utilities

We strongly recommend that you now install the PS Executive Series
Utilities software that came with your printer because it includes

- Printer drivers and printer description files required for print-
  ing from many Macintosh applications.

- Utilities for installing printer-resident screen fonts, renaming
  the printer, downloading fonts, and managing hard disks, and
  printing font samples.

To install the utilities software

**1   Turn on your Macintosh and insert the Macintosh Format PS
     executive Series Utilities disk.**

2   Double-click the PSExec3.*xx*.sea file.

3   Choose Continue in the window that appears.

**4   Specify a folder to install the utilities to in the window that
     appears and choose Save.**

5   After all the files are extracted, choose Quit.

**6   Open the Utilities folder in the PSExec 3.*xx* Folder and dou-
     ble-click PSInstall to personalize the program.**

Macintosh Printer Drivers

To be able to print from your applications, you must have a QMS 4525 Print System-compatible driver installed on your Macintosh. Most Macintosh applications use the Apple LaserWriter driver that comes with the Macintosh system software. However, we recommend installing the LaserWriter 8.*x* driver and the QMS 4525 Print System PPD file included on the PS Executive Series Utilities Macintosh Format disk, because they support performance enhancements such as the sorter, stacker, stapler, and multiple bins for your printer.

To install the QMS-supplied LaserWriter 8.*x*

1   **Follow the instructions given above for extracting and installing PS Executive Series Utilities.**

2   **Open the System Utilities folder inside the Drivers folder inside the PSExec 3.*xx* Folder to display LaserWriter 8.*x* (among other things).**

3   **Drag the LaserWriter 8.*x* icon onto your current System Folder. (The system knows where to put it.)**

4   **System 7 users: Create a folder called Printer Descriptions inside the Extensions folder inside the Systems Folder.**

   System 6 users: Create a folder called Printer Descriptions inside the Systems Folder.

5   **Open the PPDs folder inside the Drivers folder on the PSExec 3.*xx* Folder.**

6   **Open the Ver 4.0 folder inside the PPD folder.**

7   **Use the Select All option in the Edit menu to select all the printer description files in the Ver 4.0 folder.**

8   **Drag all the printer description files from the Ver 4.0 folder to the Printer Descriptions folder you created in step 4.**

9   **Restart the Macintosh.**

10 **Choose Chooser from the Apple menu.**

11 **In the Chooser window, select the QMS 4525 Print System.**

12 Choose the Setup button.

13 Choose the Select PPD button to set up printer-specific features. (Choose the AutoSetup button to set up the printer automatically.).

14 Choose QMS 4525 Print System.

15 Choose Select. Now you can access printer features (such as multiple bins) by choosing Options in the Print dialog box. Choose Help in the Options dialog box for information on these options.

» Note: All Macintosh users on a network must use the same version of LaserWriter (and with System 6, the same version of Laser Prep) to run correctly. However, you do not need Laser Prep if you use a LaserWriter file version 6.1 or higher (such as the LaserWriter included with the PS Executive Series Utilities). For example, if the network has a mixture of LaserWriter 6.0 and 7.0, it will experience frequent reinitialization problems.

Check the version number by selecting the LaserWriter icon, then holding down the Command key while pressing the letter I. The driver version number appears in the Info window on the second to last line.

Printer Description Files

In addition to LaserWriter and Laser Prep, many Macintosh applications, including Aldus PageMaker, Aldus FreeHand, Adobe Separator, and QuarkXPress, use special printer description files. The PS Executive Series Utilities include these special files, called APD (Aldus Printer Description), PPD (PostScript Printer Description), PDX (Printer Description Extension), and PDF (Printer Description File). See "Using the Macintosh Utilities" in the PS Executive Series Utilities documentation for details.

Adobe Separator uses the PPD file. You have to tell Separator where the PPD is. Check your Adobe documentation for details.

QuarkXPress uses the file called PDF. Each printer model requires its own PDF. You must load the PDF in the same folder as the

QuarkXPress application. Check your QuarkXPress documentation for details.

Aldus PageMaker 4.2 and higher use PPD and PDX files. The PDX works in conjunction with the standard PPD to expand printer capabilities. The PPD and PDX must be placed in the PPDs folder within the Aldus folder inside your System Folder.

Aldus PageMaker 4.01 and earlier use the APD file. The APD gives PageMaker information specific to your printer type. Different versions of PageMaker require the APD to be installed in different ways. Check your PageMaker documentation for details.

Aldus FreeHand 3.0 and higher use PPD and PDX files. The PDX works in conjunction with the standard PPD to expand printer capabilities. The PDX and PPD must be placed in the PPDs folder inside the Aldus folder inside your System Folder.

Aldus PrePrint uses PPD and PDX files. The PDX works in conjunction with the standard PPD to expand printer capabilities. The PDX and PPD must be placed in the PPDs folder inside the Aldus folder inside your System Folder.

If you do not install these files for your printer, you can still print from the applications using other printer options. However, you may get some error messages informing you that you may need to change the printer type, and you may not have all your printer capabilities available to you.

Testing Macintosh Communication

You can check that the printer selected in the Chooser and the Macintosh are communicating by printing a directory:

1   Display a disk or folder window.

2   Choose Page Setup from the File menu. Select paper size, printing orientation, and any other necessary options. Then select OK.

3   Choose Print Directory or Print Window from the File menu. A dialog box appears.

**4   Select the printing options you want to use, then click OK. If
no page prints, check the "Apple Macintosh Checklist" in
chapter 6 of the *QMS 4525 Print System User's Guide*.**

Connecting via the Parallel Port

Parallel communication is faster than serial communication, so it is
best if

- A parallel port is available on your host

- The host and printer are within 6.5 feet (approximately 2
  meters) of each other

- You print a lot of graphics

A parallel cable has a 36-pin male connector on the printer end and a
25-pin male connector on the host end. This cable is available from
your QMS vendor. A Dataproducts adaptor kit (short-line only) is also
available from your vendor.

Caution: When you are connecting the printer to a host, first turn off the
host and the printer.

Use the following procedure to connect your printer to your host via
the parallel port:

**1   Attach the 36-pin printer end of the cable to the parallel port
on the printer, then close the clips.**
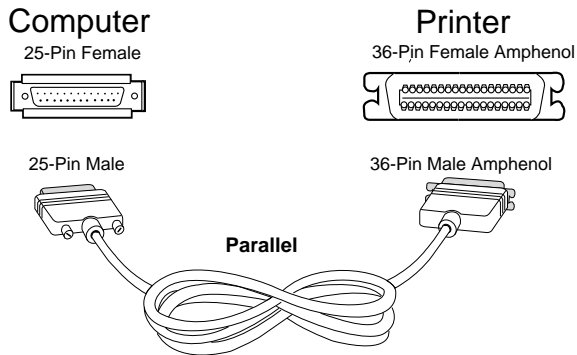
2   Attach the other end of the cable to the host's parallel port.

**3   The factory default parallel settings (PostScript, 8 data bits)
are appropriate for most parallel communications.**

Use the printer control panel to set up parallel communication, if
necessary. Refer to chapter 4, "Communications Menu," if you
need more information. Refer to appendix B, "Cable Pinouts," for
cable pinout information.

**4   In your applications, select a QMS 4525-compatible printer
driver.**

If you use other than a QMS 4525-compatible driver with this
printer, you may be able to print, but you may not be able to take
advantage of all the printer's features. (See your application doc-
umentation for more information. Also, application notes, which
are tips for printing from specific applications, are available from
Q-FAX and the QMS Bulletin Board. Appendix A, "QMS Cus-
tomer Support," explains how to use these QMS information ser-
vices.

Testing Parallel Communication

To test communication between your printer and host, first create a short
file that ejects a page from the printer. Then send the file to the printer.

Creating the Test File

To create the test file, type the following commands at the DOS
prompt (you can use either uppercase or lowercase letters; however,
you must type the PostScript **showpage** operator in lowercase let-
ters). The symbol means to press the Enter key. To produce the ^D
and ^Z, press and hold down the Ctrl key while you type the appropri-
ate letters (d and z). These characters signify the end of the file and
must always be included.

```
copy con printest.ps↵
showpage↵
^D^Z↵
```

Sending the Test File

To test parallel communication, type the following command at the
DOS prompt to send the PRINTEST.PS file you just created to the
printer:

```
print printest.ps↵
```

If prompted for the name of the list device, type

```
lpt1↵
```

If the printer and host are communicating, a blank page should eject
from the printer. You need make no further changes. Go to the "Print-
ing Software" section, later in this manual

If a blank page does not eject and you typed the file correctly, check
the following:

- In your AUTOEXEC.BAT file, is LPT1 (the parallel port) being
  directed to COM1 (the serial port). If the AUTOEXEC.BAT file
  contains the line

  ```
  MODE LPT1=COM1
  ```

delete it. Then type

```
mode lpt1:,,p
```

in the AUTOEXEC.BAT file so that print jobs are sent until the printer accepts them. Reboot your computer and try the communication test again.

If the communication test still does not work, see chapter 6, "Troubleshooting," in the *User's Guide* and refer to your DOS documentation for more information.

Refer to appendix B, "Cable Pinouts," for cable pinout information.

Connecting via the Serial Port

Serial communication is best if

- A parallel port is not available on your host

- The host is more than 6.5 feet (approximately 2 meters). For best results, the serial cable should be less than 25 feet (approximately 7.6 meters) long.

The standard serial cable has a 25-pin male (DB25) connector on
the printer end and either a 9-pin female connector or a 25-pin
female connector on the host. The serial cable is a null modem
cable.
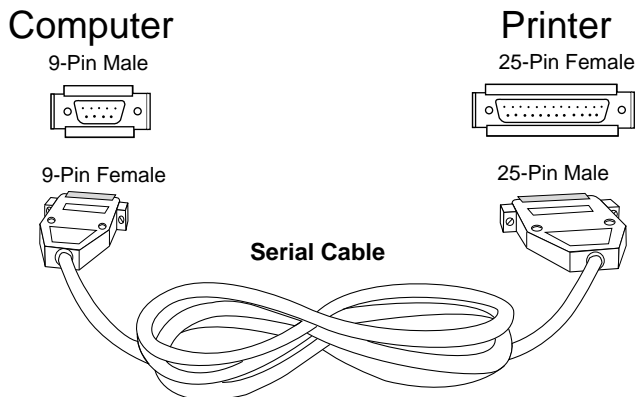
Caution: Turn off both the printer and the host before making the
connection.

Use the following procedure to connect your printer to your host via
the serial port:

1   **Insert the 25-pin male printer end of the cable into the
    printer's serial port (see illustration above), then tighten the
    screws on the cable to attach it to the printer.**

2   **Attach the other end of the cable to the host's serial port (see
    illustration above).**

    On some hosts, the 25-pin parallel port and the 25-pin serial port
    may look similar, but the parallel port is female and the serial port
    is male.

3   **See the following sections, "Printing via the Serial Port" and
    "Changing Serial Communication."**

Use the printer control panel to set up serial communication
(described earlier in this manual).

**4   In your applications, select a QMS 4525-compatible printer
driver.**

If you use other than a QMS 4525-compatible driver with this
printer, you may be able to print, but you may not be able to take
advantage of all the printer's features. See your application docu-
mentation for more information. Also, application notes, which are
tips for printing from specific applications, are available from Q-
FAX and the QMS Bulletin Board. Appendix A, "QMS Customer
Support," explains how to use these QMS information services.

Printing via the Serial Port

Before you can print to the serial port, the printer, host, and application
must all communicate using the same serial port settings. If your printer
is replacing another printer, and you are using the same cable to connect
it to the host, the host is probably already configured correctly. However,
if the host has not been connected to a printer before, or if you are using
a different cable, use the information in the following sections to test the
communication between printer and host.

Testing Serial Communication

To test communication between your printer and host, first create a
short file that ejects a page from the printer, then send it to the printer.

Creating the Test File

To create the test file, type the following commands at the DOS
prompt (you can use either uppercase or lowercase letters; however,
you must type the PostScript **showpage** operator in lowercase let-
ters). The symbol means to press the Enter key. To produce the ^D
and ^Z, press and hold down the Ctrl key while you type the appropri-
ate letters (d and z). These characters signify the end of the file and
must always be included.

```
copy con printest.ps↵
showpage↵
^D^Z↵
```

Sending the Test File

To test serial communication, type this command at the DOS prompt
to send the PRINTEST.PS file you just created to the printer:

```
print printest.ps↵
```

If prompted for the name of the list device, type

```
com1↵
```

If the printer and host are communicating, a blank page ejects from
the printer. If a blank page does not eject and you typed the file cor-
rectly, check the following:

■ In your AUTOEXEC.BAT file, do the printer's serial port set-
tings match those of the PC. Look for a command line like this
in your AUTOEXEC.BAT file:

```
mode com1:9600,n,8,1,p
```

In this example, the serial port settings are 9600 for baud
rate, n (no) parity, 8 data bits, and 1 stop bit. The p stands for
infinite retry.

Now check the start-up page, which prints when you turn on
the printer (unless you disabled it). This tells you the current
serial port settings for the printer. If the serial settings (baud
rate, parity, data bits, and stop bits) shown on the start-up
page match those in your AUTOEXEC.BAT file, you need
make no further changes. Go to the section "Printing Soft-
ware" later in this chapter.

If the printer's serial port settings are different from your PC's,
you must make them match. Refer to the following section,
"Changing Serial Port Settings," to do this.

If the communication test still does not work, see chapter 6 in the
QMS 4525 Print System User's Guide and refer to your DOS docu-
mentation for more information.

Changing Serial Port Settings

Since your printer is configured at the factory for the most typical
printing environments, the serial port settings in your
AUTOEXEC.BAT file and on the start-up page are probably the same.
However, if they differ, you must set up the printer to use the serial
settings specified in the AUTOEXEC.BAT file. The following instruc-
tions explain how to use the printer's control panel to configure the
serial port (* represents a default setting). Chapter 2, "The Control
Panel," provides complete information about changing printer configu-
ration options.

**1 Press the printer control panel Line key. The On LED goes
    out and**

    IDLE

displays.

**2 Press the Back key to enter the Operator Control menu, then
    press the Next key once to display**

    OPERATOR CONTROL   ADMINISTRATION

**3 Press the Enter key to enter the Administration menu, then
    press the Next key one or more times until**

    ADMINISTRATION   COMMUNICATIONS

    displays.

**4 Press the Enter key to enter the Communications menu, then
    press the Next key one or more times until**

    COMMUNICATIONS   SERIAL

    displays.

**5   Press the Enter key to enter the Serial menu, then press the
      Next key one or more times until**

```
SERIAL                  BAUD RATE
```

displays.

**6   Press the Enter key to enter the Baud Rate menu. The cur-
      rently selected baud rate displays:**

```
COMMUNICATIONS          *9600 BAUD
```

**7   Press the Next key to cycle through the list of baud rates.
      Available serial baud rates are**

```
   300 BAUD      4800 BAUD
   600 BAUD     *9600 BAUD
  1200 BAUD     19200 BAUD
  2400 BAUD     38400 BAUD
```

**8   When the desired baud rate is displayed, press the Enter key.
      The message**

```
RATE                    IS SELECTED
```

(where `RATE` is the baud rate you selected) momentarily displays
and then

```
SERIAL                  BAUD RATE
```

If you want to change other settings, use the Next key to scroll to
the setting you want to change, then repeat the procedure
described in steps 6 through 8.

If you do not want to change other serial settings, press the Line
key.

```
SAVE CHANGES?            NO
```

displays. To save your change, press the Next key so that the
message window displays

```
SAVE CHANGES?            YES
```

Press the Enter key to save the change. The On indicator lights,
and

```
IDLE
```

displays.

**9   To verify the changes you just made, turn the printer off,
then back on. Compare the printer's start-up page to your
AUTOEXEC.BAT file.**

PC Printing Software

If you're replacing a PostScript printer, you can probably start printing
now with the printing software already in place. Refer to your applica-
tion documentation for instructions on sending documents to the
printer.

However, if you want to be able to use all your printer's special fea-
tures (like collation, jogging, and stapling), **or** if you've never printed
to a PostScript printer before, we recommend you take a few minutes
to make sure you have the following printing software installed:

■   PS Executive Series Utilities

■   A Windows printer driver

Installing PS Executive Series Printer Utility Software

PS Exec, included on the DOS format disks we shipped with your
printer, is a utilities program for controlling the printer from the com-

puter. For example, through PS Exec you can turn off the start-up
page, rename the printer, download fonts, print font samples, and
manage hard disks. Many of the procedures described in this manual
involve using PS Exec. The README file on the PS Executive disk
explains how to install the program, and the on-line help explains how
to use it.

Installing a PostScript Printer Driver

If you're using Windows, we recommend that you install the
QMS-developed Windows driver (QSCRIPT.DRV), which is on the
disk called Windows Drivers (shipped with the printer). Instructions for
installing and activating the driver are in the README file on that
disk.

» Note: The QMS-developed Windows driver supports all the printer's media
sizes. However, if you experience printing problems while using our driver, try
using the Microsoft driver provided with Windows, along with our WPD file,
which is on the Windows Drivers disk included with the printer. See the
README file on the disk for information on using the WPD.

If you're using a non-Windows application, read the printing sec-
tion of the application documentation for information on choosing a
PostScript driver. If the application does not provide a PostScript
driver, contact the application manufacturer to see if one has become
available since you bought the program. Also, PostScript drivers for
some applications are available through the QMS Corporate Bulletin
Board System and through CompuServe; see appendix A, "QMS
Customer Support," for information.

Also, check to see if application notes (tips for printing from specific
applications) are available for your application from Q-FAX, the QMS
bulletin board, or CompuServe. Appendix A, "QMS Customer Sup-
port," explains how to use these QMS information services.

PC Screen Fonts

Screen fonts allow you to see on the screen how your document looks
before it is printed. However, you can use the printer fonts without
having the corresponding screen fonts.

You may be able to obtain PC screen fonts from your application man-
ufacturer.

Connecting via an Optional Network Interface

In addition to the three standard interfaces LocalTalk, parallel, and
serial, your printer has the option of using one or two network inter-
faces, such as DECnet, TCP/IP, Novell NetWare, and EtherTalk on
Ethernet networks, and TCP/IP and Novell NetWare on Token-Ring
networks. These additional interface options allow greater flexibility
when working in a complex network environment. See your QMS ven-
dor for a list of available network interfaces.

Local Console Connection

The printer interface panel provides an RS-232C serial port for a local
console. Connect the RS-232C console to the port with a null-modem
cable. Refer to appendix B, "Cable Pinouts," for cable pinout information.

External SCSI-2 Port

The external SCSI-2 port is a DB-50 female connector. You can connect
up to six external hard disks to the port with a SCSI-2 adaptor cable.
Refer to appendix B, "Cable Pinouts," for cable pinout information.

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External SCSI-2
Port

External SCSI-2
Port

A

QMS Customer Support

In This Chapter . . .

- Sources of customer support
- QMS world-wide offices

Sources of Support

Several sources of help and information are available, depending on the type of help you need:

Your QMS Vendor

Your local vendor (the one from whom you bought the printer) may be best equipped to help you. Your vendor has specially trained service technicians available to answer questions, and the equipment to analyze your printer problems.

Your Application Vendor

Often, "printing" problems have more to do with the application being used than with the printer. In this case, the application manufacturer is the best source of help.

Q-FAX

Q-FAX, a QMS information retrieval service, provides application notes, technical support notes on common printing problems, and information about printer specifications, options, accessories, consumables, and prices.

In the United States and Canada, call (800) 633-7213 to reach Q-FAX. In all other countries, call (205) 633-3850. Have your fax number handy when you call (or place the call from your fax machine's handset).

» *Note: The 205 area code will change to 334 on January 15, 1995.*

You can choose to have either a directory (a list of currently available documents on a particular topic) or a specific document sent to you. The first time you call, request the directory (press 2 on your phone or fax keypad when prompted). Then call back to request specific documents. You can order up to three documents per call.

The QMS Corporate Bulletin Board System

The QMS Corporate Bulletin Board System (BBS) contains technical support notes, application notes, drivers, patches, and utilities, and you may leave technical questions not requiring an immediate response on electronic mail for the Sysop (System Operator).

The bulletin board [(205) 633-3632] operates at 1200, 2400, 9600, and 14400 baud, 8 data bits, no parity, 1 stop bit, with XMODEM and YMODEM capabilities. Contact QMS Customer Technical Assurance for more information about the bulletin board.

» Note: The 205 area code will change to 334 on January 15, 1995.

CompuServe

Through CompuServe, you ask general (non-technical) questions, share information with other users, and access printing information and programs. When you use CompuServe, type one of the following commands:

■ `go qmsprint` takes you to the DTP Vendor forum; QMS is section 3 of that forum

The QMS library section contains application notes, printer drivers, utilities, technical information, and announcement files.

Internet

The QMS server provides access to technical reports, new product announcements, a trade show schedule, and other general information about QMS.

You can access the QMS server via any one of the many web viewers available to Internet users. If you don't have access to a web viewer, we recommend the NCSA Mosaic web viewer (Mosaic is at ftp.ncsa.uiuc.edu). The QMS home page is at http://www.qms.com/. The QMS ftp resource is ftp.qms.com.

QMS National Service

If you have a problem you cannot resolve, contact QMS National Service. The following service call message requires that you contact QMS National Service:

SERVICE CALL *xxx*

Phone Numbers

(800) 762-8894	Service information and maintenance pricing for QMS and other manufacturers printer's
1-800-858-1597	On-site service and depot repair information
	7 a.m. to 7 p.m. Central Time
1-205-633-4300	Spare parts ordering and information
Extension 2530	8 a.m. to 5 p.m. Central Time

» Note: The 205 area code will change to 334 on January 15, 1995. The above numbers are valid in the United States. To contact QMS in other countries, see the "World-wide Offices" section later in this appendix.

QMS Customer Technical Assurance (CTA)

QMS Customer Technical Assurance is available from 7 a.m. to 6 p.m., Central Standard Time, at (205) 633-4500 (US). You can also fax questions to CTA at (205) 633-3716 (US). Please indicate whether you would like a faxed or a phoned reply.

» Note: The 205 area code will change to 334 on January 15, 1995.

If you call for assistance, have the following information ready so our technicians can help you more quickly:

- Your phone number, fax number, and shipping address
- A description of the problem
- The printer model
- The type of host computer you are using
- The type and version of operating system you are using
- The interface you are using, and, if serial, the protocol
- The application and version you are using
- The emulation you are using
- Your printer firmware version (listed on the status and start-up pages)

QMS World-wide Offices

United States/ Latin America	QMS, Inc. One Magnum Pass Mobile, AL 36618 (205) 633-4300 Product Information: (800) 631-2692 or (800) 631-2696 National Service: (800) 858-1597 OEM Information: (800) 631-2692 Consumables: (800) 777-7782 Fax: (205) 633-4866 E-mail: info@qms.com Latin America Fax: (205) 639-3347 » Note: The 205 area code will change to 334 on January 15, 1995.
Asia-Pacific	QMS Asia-Pacific Auckland 64 (9) 630 7912 Melbourne 61 (3) 899 5777 Sydney 61 (2) 901 3235 Tokyo (81) (3) 3437 4030
Canada	QMS Canada, Inc. 9630 Rte. Trans-Canadienne Saint-Laurent, Québec H4S 1V9 Telephones: (514) 333-5940, (800) 361-3392 Fax: (514) 333-5949 National Service: (800) 268-4969 National Service Fax: (905) 673-7676 Offices in Ottawa, Québec City, Toronto, and Vancouver
Europe, Middle East, Africa	Düsseldorf (49) 211/596 1333 London (44) 784 430900 Maarssen (31) 3465 51 333 Paris (33) (1) 4107 9393 Stockholm (46) (8) 725 5680

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B

Cable Pinouts

LocalTalk

The table below gives the correct pinouts for the printer end of the 9-pin LocalTalk cable used to connect a computer and printer.

Pin No.	Name
1	Ground
2	No Connection
3	Ground
4	Transmit +
5	Transmit -
6	No Connection
7	Sync
8	Receive +
9	Receive -

Serial

The table below gives the correct pinouts for the printer end of the 25-pin serial cable used to connect a computer and printer:

Pin No.	Name
2	Transmit Data
3	Receive Data
4	Request to Send (optional)
5	Clear to Send
6	Data Set Ready (optional)
7	Signal Ground
8	Data Carrier Detect
20	Data Terminal Ready (optional)
22	Ring Detector
24	Reserved
25	Reserved

IBM PC/XT, PC/AT, and Compatible Computers

The following tables show the suggested pinouts for IBM PC/XT, PC/AT, and compatible computers.

Printer DB-25S	IBM PC/XT DB-25P
1	1
2	3
3	2
4	5
5	4
20	6 + 8
6 + 8	20
7	7

Printer DB-25S	IBM PC/AT DB-9P
1	1
2	2
3	3
7	5
20	6 + 8

Centronics Parallel

The following table describes the Centronics parallel interface cable that can be used with your printer. (See "Notes to the Centronics Parallel Cable Pinouts Table" on the next page for more information.)

Signal Pin No.	Return Pin No.	Signal	Direction
1	19	STROBE-	In
2	20	DATA 1	In
3	21	DATA 2	In
4	22	DATA 3	In
5	23	DATA 4	In
6	24	DATA 5	In
7	25	DATA 6	In
8	26	DATA 7	In
9	27	DATA 8	In
10	28	ACKNLG-	Out
11	29	BUSY+	Out
12	30	PE+	Out
13	-	GND	-
18	-	VCC TEST	-
19-30	-	GND	-
31	-	IPRIME	In
32	-	FAULT-	Out
33	-	GND	-
34	-	RESERVED	-
35	-	RESERVED	-

Notes to Centronics Parallel Cable Pinouts Table

Direction refers to the direction of signal flow as viewed from the printer.

Return denotes twisted-pair return and is to be connected at signal-ground level. When wiring the interface, be sure to use a twisted-pair cable for each signal and never fail to complete connection on the return side. To prevent noise effectively, these cables should be shielded and connected to the chassis of the system unit and printer, respectively.

All interface conditions are based on TTL level. Both the rise and fall times of each signal must be less than 0.2 microseconds.

Data transfer must be carried out by observing the ACKNLG and BUSY signal.

The cable must have an overall braided shield, Belden 8345 or equivalent.

Connectors must have shielded housings. The overall shield must be bonded to the shielded housings at both ends of the cable.

Dataproducts Parallel

The following table describes the Dataproducts parallel interface cable that can be used with your printer.

Signal Pin o.	Return Pin No.	Signal Description	Direction
1	2	Data Bit 3	In
11	-	Parity Error (grounded)	
12	-	+5V (limited by 1K ohm resistor)	Out
19	3	Data Bit 1	In
20	4	Data Bit 2	In
21	5	Online	Out
22	6	Ready	Out
23	7	Demand	Out

Signal Pin o.	Return Pin No.	Signal Description	Direction
28	44	Data Bit 8	In
30	14	Paper Instruction	In
34	18	Data Bit 5	In
36	35	Data Bit 7	In
38	37	Strobe	In
39	-	Logic Ground	
41	40	Data Bit 4	In
43	42	Data Bit 6	In
45, 46	-	Interface Verify	

Local Console Connection

Use a null-modem cable to connect an RS-232C console to the console port on the printer interface panel. The pinouts are

Pin	Signal
2	TxD
3	RxD
7	Ground

External SCSI-2 Port

Use a SCSI-2 adaptor cable to connect up to six external SCSI hard disks to the SCSI port on the printer interface panel. The pinouts are

Pin	Signal
1, 3, 5, 7, 9, 11, 13 15, 17, 19-24, 27-31 33-35, 37, 39, 41 43, 45, 47, 49	Ground
2	Data 0
4	Data 1
6	Data 2
8	Data 3
10	Data 4
12	Data 5
14	Data 6
16	Data 7
18	DBP
26	Terminator power (+5V)
32	ATEN*
36	BSY*
38	ACKN*
40	RST*
42	MSG*
44	SEL*
46	CD*
48	REQ*
50	IO*

❖

External SCSI-2
Port

C

Manual Notices

Manual Notice

QMS, Inc. reserves the right to make changes to this manual and to the equipment described herein without notice. Considerable effort has been made to ensure that this manual is free of inaccuracies and omissions. **However, QMS, Inc. makes no warranty of any kind including, but not limited to, any implied warranties of merchantability and fitness for a particular purpose with regard to this manual**. QMS, Inc. assumes no responsibility for, or liability for, errors contained in this manual or for incidental, special, or consequential damages arising out of the furnishing of this manual, or the use of this manual in operating the equipment, or in connection with the performance of the equipment when so operated.

FCC Compliance

This equipment has been tested and found to comply with the limits for a **Class A** digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

» Note: To comply with Part 15 of FCC Rules, shielded interface cables must be used.

☞ **Caution:** Any modifications or changes to this product not expressly approved by the manufacturer responsible for compliance to Federal Regulations could void the user's authority to operate this product within the Laws and Regulations of the Federal Communications Commission.

☛ ☀ **WARNING!** To prevent electrical shock, do not remove any covers from your printer unless you are experienced in working with circuit boards and are following instructions for procedures described in QMS documentation.

ACHTUNG! Um elektrische Kurtzschlüsse zu vermeiden, entfernen Sie keine Gehaüsteile von Ihrem Drucker, wenn Sie keine Erfahrungen im Umgang mit elektrischen Bauteilen haben. Befolgen Sie die in der QMS Dokumentation beschriebenen Hinweise.

Laser Safety

This printer is certified as a Class 3B laser product under the US Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

International Notices

Canadian Users

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques (de la classe A) prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Vfg 1046/1984 Conformity Statement

Hierdurch bescheinigen wir, daß dieses Produkt in Übereinstimmung mit Postordnung 1046/1984 ist und RFI unterdrückt ist. Die Geschäftslage und der Verkauf diese Geräte auszuprobieren, mit der Übereinstimmung und der Regierung zu bestätigen, wurde der Deutschen Bundespost gegeben.

Bescheininigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß QMS 4525 Print System in Übereinstimmung mit den Bestimmungen der Vfg 1046/1984 funkentstört ist. Der Deutschen Bundespost wurde das Inverkehrbri ngen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

QMS, Inc., Mobile, AL, USA

Declaration of Manufacturer/Importer

We hereby certify that the QMS 4525 Print System is in compliance with Vfg 1046/1984 and is RFI suppressed.

The marketing and sale of this equipment was reported to the German Postal Service.

The right to retest this equipment to verify compliance with the regulation was given to the German Postal Service.

QMS, Inc., Mobile, AL, USA

Electronics Emissions

Your printer complies with the Electronics Emissions Requirements of the German Federal Minister for Postal and Telecommunication Technology regulation

Vfg 1046/1984

Your printer complies with the Electronics Emissions Requirements of the European Economic Council directive.

82/499/EEC

Colophon

This manual was written and formatted in FrameMaker. Some illustrations were created in Adobe Illustrator and translated to WMF format using Transverter Pro, other illustrations were created directly in FrameMaker. Typefaces chosen are Benguiat, Courier, Helvetica, MarkerFelt, and Tekton. The manual was printed in camera-ready form on a QMS printer.

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Colophon

D

Technical Specifications

Print Engine Specifications

Type

Electronic laser printer, floor model.

Resolution

300 dpi (dots per inch) or 12 dots per millimeter.

Laser Safety

The overall printer operating condition is Laser Class 1 apparatus according to IEC 825. There is no radiation outside the printer.

Printing Speed

Maximum of 45 prints per minute.

Warm-up Time

Less than 6 minutes.

Input Bins

Upper Input Bin

- **Capacity**

  600 sheets of 20 lb ($75g/m^2$) paper
  400 sheets of 32 lb ($120 g/m^2$) paper

- **Supported Paper Weights**

  16 to 32 lbs (60 to 120 g/m^2)

Lower Input Bin

■ **Capacity**

1600 sheets of 20 lb (75 g/m^2) paper

■ **Supported Paper Weights**

20 to 27 lbs (75 to 100 g/m^2)

Input Bin Configuration

Each input bin can be configured to accommodate one size paper.
The possible combinations for the two input bins are

- letter and legal small

- letter and legal large

- quarto and A4

- commercial and A4

- letter and A4

- A4 and foolscap

- A4 and folio

» Note: Paper input bin configuration must be done by a QMS Service
Engineer.

Output Bins

Standard Output Bin

■ **Capacity**

Maximum of 20 sheet

Output Bin Options

■ **20-bin face-down sorter**

Total capacity–2000 sheets

Each sorter bin can hold a maximum of 100 sheets of 16 to 27 lb (60 to 100 g/m^2) paper or a maximum of 50 sheets of 27 to 32 lb (100 to 120 g/m^2) paper.

- **40-bin face-down sorter**

    Total capacity–4000 sheets
    Each sorter bin can hold a maximum of 100 sheets of 16 to 27 lb (60 to 100 g/m^2) paper or a maximum of 50 sheets of 27 to 32 lb (100 to 120 g/m^2) paper.

- **Stacker/stapler**

    Total capacity–2200 sheets: 500 in the upper bin and 1700 in the stacker bin, with offset stacking of 1" (25 mm).
    Staples and stacks a maximum of 35 sheets.

- **Side output bin**

    The side output bin can hold a maximum of 100 sheets of 21 lb (80 g/m^2) paper. The total capacity of other media varies.

Photoconductor

Endless belt with light sensitive ZnO layer.

Charging System

Twin corona wire, about 7.5 kV.

Exposure System

20 mW infra-red (800 nm) semiconductor laser. Spinner with 10 facet polygon mirror.

📳 **Caution**: Laser class 3B can damage your eyes.

Developing System

Magnetic brush development with mono-component toner. Toner can be refilled by the system administrator or by a QMS Service Engineer.

Fusing Mechanism

Heat and pressure.

Toner

Print capacity per 3.2 lb (1.45 kg) bottle of toner: 55,000 prints.

Total toner bin print capacity–192,500 prints.

Cleaning System

Magnetic brush cleaning.

Power Consumption

The following figures reflect the average power dissipation per hour:

- Switched off (only dew prevention functioning): 50 W

- During warm-up: 3500 W

- On stand-by: 800 W

- Operating: 1750 W

- During printing (with 20-bin sorter installed): 2100 W

Electrical Requirements - US Version

- One phase 208 V (+10%); max. 16 A; 60 Hz (+2%)

- One phase 230 V (+10%); max. 15 A; 60 Hz (+2%)

Physical Specifications

Weight

- Print engine 860.0 lbs (418 kg)

- 20-bin sorter 167.6 lbs (76 kg)

- 40-bin sorter 253.6 lbs (115 kg)

- Stacker/stapler 180.8 (82 kg)

Weight of Packaging

- Print engine 143.3 lbs (65 kg)

- 20-bin sorter 22.1 lbs (10 kg)

- 40-bin sorter 26.5 lbs (12 kg)

- Stacker/stapler 28.7 lbs (13 kg)

Weight of Consumables

- Bottle of toner 3.2 lbs (1.45 kg)

- Pack of 21 lb (80 g/m^2) A4 paper 5.5 lbs (2.5 kg)

- Master belt 2.2 lbs (1 kg)

Outer Dimensions

Height

- Without sorter 41.6" (1055 mm)

- With 20-bin sorter 77.0" (1955 mm)

- With 40-bin sorter 86.3" (2190 mm)

- With stacker/stapler 63.1" (1600 mm)

Width

- Without buffers 56.3" (1430 mm)

■ With buffers 57.7" (1465 mm)

Depth

■ Without buffers 29.0" (735 mm)

■ With buffers 30.3" (770 mm)

Space Requirements

■ **For operator**: 24" (600 mm) at the front, on the right-hand and the left-hand side

■ **For service**: 24" (600 mm) on all sides

■ **Angle of inclination**: Maximum of 4°

Room Ventilation

Recommended: Minimum of 438 cubic feet/hour (12.5 m^3/h)

Room Volume

Recommended: Minimum of 855 cubic feet (25 m^3)

With this room volume and the recommended room ventilation the ozone emission is within the Threshold Limited Value for ozone (0.2 mg/m^3).

✍ **Caution:** For removal of heat, extra ventilation may be necessary.

Acoustic Noise Emission

■ Stand-by: maximum 47 db (A)

■ Printing: maximum 64 db (A)

■ Impulse: maximum 73 db (A)

✍ **Caution:** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Hard Disks

Only QMS 344 MB internal and external hard disks are approved. Contact your QMS vendor. See appendix A, "QMS Customer Support," for a information on how to contact your QMS vendor.

Print Media Specifications

Supported Print Media

Input Bins

■ Plain, colored, and letterhead paper–16 - 32 lb (60 - 120 g/m²)

Manual Feed

» Note: Some special materials may cause an image enlargement or reduction of up to 2% of the size normally expected.

■ Plain, color, and letterhead paper–13 - 45 lb (50 - 170 g/m²)

■ Plain paper–53 lb (200 g/m²)

» Note: The fusing is slightly reduced on this weight paper.

■ Plain color/embossed paper–45 lb (170 g/m²)

■ Clear and color transparencies

■ PD300, PD500, and PD1000 offset plates

■ Adhesive labels

» Note: To minimize the risk of gumming up the photoconductor belt, use adhesive labels with a glue area somewhat smaller than the paper area.

■ Durable form

■ Clear adhesive film

■ Drafting film

■ Drafting paper

■ Preprinted paper (quick-drying and heat-proof ink)

» Note: The ink must be heat-resistant up to 320° F (160° C) for 0.6 seconds and pressure-resistant up to 38.7 lb/in² (6 kg/cm²)for 45 milliseconds.

Do Not Use

The following media is unsupported:

■ Thin offset plates, such as PD200

■ Recycled paper

■ Vellum

Print Media Sizes and Imageable Areas

Your printer supports paper and transparencies in three sizes. Each size has a certain imageable area, the maximum area capable of being printed on. It is subject to both hardware limits (the physical page size and the margins required by the printer engine) and software constraints (the amount of memory available for the full-page frame buffer).

Following are the supported paper types and their imageable areas:

	Inches		Millimeters	
Paper Type	Page Size	Imageable Area	Page Size	Imageable Area
Letter	8.5 x 11.0	8.19 x 10.66	216 x 279	208 x 271
Legal Large	8.5 x 14.0	8.19 x 13.69	216 x 356	208 x 348
A4	8.3 x 11.7	7.95 x 11.37	210 x 297	202 x 289
Quarto	8.0 x 10.0	7.67 x 9.68	203 x 254	195 x 246
Commercial	8.3 x 10.6	7.95 x 10.31	210 x 270	202 x 262
Foolscap	8.0 x 13.0	7.67 x 12.67	203 x 330	195 x 322

	Inches		Millimeters	
Paper Type	**Page Size**	**Imageable Area**	**Page Size**	**Imageable Area**
Folio	8.3 x 13.0	7.95 x 12.67	210 x 330	202 x 322
Legal Small	8.5 x 13.0	8.19 x 12.67	216 x 330	208 x 322

» Note: If a requested paper size is not installed in the printer, you are prompted to install the correct paper.

Consumables

Toner

Mono-component toner.

The toner is not classified as hazardous waste under the present EPA regulations. Place in a plastic bag or other sealed container to prevent dust and dispose of by burial in a sanitary landfill or incineration in accordance with any applicable federal, state, and local regulations.

■ In case of spills, remove with vacuum cleaner or cold water and soap. Do not use warm water.

■ In case of ingestion, rinse mouth with water. If large quantity is ingested, seek medical advice.

■ In case of inhalation, clean mouth, nose, and throat; cough up.

■ If you get toner on your skin, wash with cold water and soap.

■ If you get toner in your eyes, rinse with large quantity of cold water.

Master Belt

Zinc oxide photoconductive belt for laser printers.

To our knowledge, this master belt presents no health hazards in normal use. Material is not classified as hazardous waste under the present EPA regulations. Dispose of it in accordance with any applicable federal, state, and local regulations.

❖

Consumables

E

Manual Updates

Introduction

This appendix provides updated information on the DOC commands or PostScript operators that are supported on your QMS 4525 Print System (with the optional stacker/stapler), but are usually documented in other QMS manuals. This information will be merged into the QMS manuals listed in this section, as they are revised. But until then, the information in this appendix supersedes the following information in the *QMS Crown Document Option Command* manual (part number 1800216-001E).

The following sections of this manual are affected:

■ Chapter 5 "Sessions"

■ Border command

■ Staple command

■ Offset stacking command

■ Line Printer Emulation lporientation command

■ PCL 4 Emulation reset and resource commands

■ All PCL 5 Emulation commands

The information in this appendix should be used in conjunction with the following QMS documents:

■ *QMS Crown Technical Reference Manual* digital (part number 1810001-001A)

■ *QMS Crown Document Option Commands* manual (part number 1800216-001E)

Hardware Requirements

This appendix provides information on the stapling and offset stacking/jogging commands for the QMS 4525 Print System. However, the optional stacker/stapler unit is required to support these commands. If

the stacker/stapler unit is not present on your QMS 4525 Print System and you send these commands, they will be accepted with no effect on printing or the operation of the printer.

QMS Crown Technical Reference Manual Updates

Communications

PS Protocol

Your QMS 4525 Print System supports a new protocol for communication between the printer and a host computer over a serial, parallel, or optional interface connection. This new protocol is called PS protocol. This binary communications protocol allows any 8-bit binary value (0-255) to be treated as data, while allowing a few of the values to function as special control characters. When communicating 8-bit binary data in binary, binary fixed, quoted binary, or quoted binary fixed mode the printer uses the quoting mechanism of the binary communications protocol (BCP) to distinguish between the special control characters and print job binary data. (See chapter 4, "Communications Menu," of this manual for information on the PS Protocol menu options for the serial and parallel menus.)

To differentiate data from the special control characters, any data that is the same as one of the following special control characters must be quoted.

ASCII Keyboard	ASCII Name	ASCII Hex	Control Function
^A	SOH	0x01	Quote data character
^C	ETX	0x03	Abort job and flush to end of file
^D	EOT	0x04	End-of-file marker
^E	ENQ	0x05	(Reserved for future use)
^Q	DC1	0x11	XON in XON/XOFF flow control

^S	DC3	0x13	XOFF in XON/XOFF flow control
^T	DC4	0x14	Job status request
^\	FS	0x1C	(Reserved for future use)

A data byte is quoted by replacing it with a two-character sequence. The first character is a ^A (ASCII hex 0x01), and the second character is the character itself XORed with the ASCII value 0x40. For example, to send the value 0x14(^T) as data, send the two-character sequence 0x01 0x54 (^a T) instead. (ASCII "T" is the result of XORing ^T with 0x40).

This method of quoting guarantees that whenever the printer receives any of the eight control characters, the control function is intended regardless of whether the preceding character is a ^A. Any data byte not equal to one of the eight special control characters is transmitted by sending the data byte. For more information on BCP and quoting, see the *PostScript Language Reference Manual* (Adobe Systems, Inc., Reading, MA: Addison-Wesley, 1990, ISBN 0-201-18127-4), the "Adobe Serial and Parallel Communications Protocols Specification" (in *Adobe Developer Support*. Adobe Systems, Inc., February 14, 1992), and the "PostScript Language Reference Manual" (in *Supplement for Version 2011*, Adobe Systems, Inc., January 24, 1992).

The PS Protocol Menu for Network 1 and Network 2

These options for the Network 1 and Network 2 PS Protocol menus set the binary communications protocol (BCP) for communicating over that interface to a PostScript printer. The default option is normal. Any change to this menu takes effect immediately.

PS Protocol Menu

Normal
Normal Fixed
Quoted Binary
Quoted Binary Fixed
Binary
Binary Fixed

Normal	Enables standard, ASCII hex protocol. Data is sent and received in ASCII format. This mode is recommended if you do not print binary data. It was designed for data in the printable ASCII range. Print jobs can alter the PS protocol value through PostScript operators.
Normal Fixed	Enables standard, ASCII hex protocol. Print jobs can not alter this value through PostScript operators.
Quoted Binary	Enables binary communications protocol. Print jobs can alter this value through PostScript operators. Data in the printable ASCII range also prints. Use the special quoting mechanism for the special characters and ^D (EOF).
Quoted Binary Fixed	Enables binary communications protocol. Print jobs can not alter this value through PostScript operators. Data in the printable ASCII range also prints. Use the special quoting mechanism for the special characters and ^D (EOF).
Binary	Enables binary communications protocol. Print jobs can alter this value through PostScript operators. Data in the printable ASCII range also prints.
Binary Fixed	Enables binary communications protocol. Print jobs can not alter this value through PostScript operators. Data in the printable ASCII range also prints.

» Note: Quoted Binary or Quoted Binary Fixed over Network 1 or Network 2 allows you to concatenate inter-mixed PostScript and non-PostScript files into a single document using the session command which is described later in this appendix.

» Note: A data stream sent through the serial or parallel interface using Binary would be treated the same as a data stream sent through Network 1 or Network 2 using Quoted Binary on your QMS Crown printer. But a data stream sent through Network 1 or Network 2 using Quoted Binary would not be treated the same as a data stream sent through the same interface using Binary. The Binary option on either Network 1 or Network 2 supports the session command which allows multiple files to be concatenated together into a single document.

Advantages

The main advantage of using the Binary, Fixed Binary, Quoted Binary, and Quoted Fixed Binary PS protocol modes when sending binary data is that these modes compress the data stream allowing your documents to be smaller so you can send smaller jobs to the printer. For example, some device drivers can format bit map images as binary data instead of as ASCII hex data.

Implementation

To implement PS protocol for sending binary data on your system you need a device driver available with some applications or operating systems, or you can alternatively use a program to read the data and write out the quoted characters. See your QMS vendor for any available information on device drivers or binary filter programs.

PostScript Operators

To take advantage of the stapling, collation, and offset stacking features of the QMS 4525 Print System the following new page device parameters are supported for the **setpagedevice** operator. The *Post-Script Language Reference Manual* by Addison Wesley (ISBN 0-201-18127-4) and the *PostScript Language Reference Manual Supplement* (November 25, 1992) contains detailed information on the **setpagedevice** operator, and the *QMS Crown Technical Reference Manual* contains information on how QMS interprets this operator in their PostScript emulation.

Statusdict Operators

The following new stapling and jogging statusdict operators are supported on the QMS 4525 Print System. The values for these operators are initialized at the start of a job in the following manner:

1   If DOC is specified, the staplemode or jogmode value is used.

2   If DOC is not specified, then the default nvram values are used.

3   Any values specified within the job override the initial values.

The NVRAM values are boolean, so they are translated to integers in the following manner:

1   A false value is translated to zero.

2   A true value is translated to three (use at end of set).

Command	**staplemode**
Syntax	**staplemode integer**
Purpose	Reports the current value of staplemode
Errors	limitcheck, stackoverflow

Command	**setstaplemode**
Syntax	*integer* **setstaplemode --**
Purpose	Sets the value of staplemode.This value is the default stapling mode for the current print job.

Parameter	*integer*
Range	0 to 4
	0—Do not staple
	2—Staple at end of job
	3—Staple after each set
Errors	rangecheck, stackunderflow, typecheck
Notes	These codes can be used

■   In a setpagedevice call (level 2 only)

<< /Staple 2 >> setpagedevice % staple at end of job

■   With a stapling statusdict operator (level 1 or level 2)

statusdict begin 2 setstaplemode end % staple at end of job

The *PostScript Language Reference Manual* by Addison Wesley (ISBN 0-201-18127-4) and the *PostScript Language Reference Manual Supplement* (November 25, 1992) by Adobe Systems Incorporated contain detailed information on the **setpagedevice** operator's stapling parameter.

Command	**defaultstaplemode**
Syntax	**defaultstaplemode** *intege*r
Purpose	Reports the default staplemode.

Notes	If you change the default value for stapling it does not affect the current job. However, if the default value is changed, the engine's nvram values for staples are also changed.
Errors	limitcheck, stackoverflow

Command	**setdefaultstaplemode**
Syntax	*integer* **defaultstaplemode --**
Purpose	Sets the default staplemode. This does not take effect until the start of the next job.

Parameter	*integer*
Range	0 to 4 0—Do not staple 3—Staple at each set
Notes	If you change the default value for stapling it does not affect the current job. However, if the default value is changed, the engine's nvram values for staples are also changed.
Errors	rangecheck, stackunderflow, typecheck

Command	**jogmode**
Syntax	**jogmode** *integer*
Purpose	Reports the current value of jogmode.
Errors	limit check, stackoverflow

Command	**setjogmode**
Syntax	*integer* **setjogmode --**
Purpose	Sets the value of jogmode.This value is the default jogging mode for the current print job.

Parameter	*integer*
Range	0 to 4
	0—Do not jog
	2—Jog at end of job
	3—Jog after each set
Errors	rangecheck, stackunderflow, typecheck
Notes	These codes can be used

■ In a setpagedevice call (level 2 only)

<< /Jog 2 >> setpagedevice % jog at end of job

■ With a jogging statusdict operator (level 1 or level 2)

statusdict begin 2 setjogmode end % jog at end of job

The *PostScript Language Reference Manual* by Addison Wesley (ISBN 0-201-18127-4) and the *PostScript Language Reference Manual Supplement* (November 25, 1992) by Adobe Systems Incorporated contain detailed information on the **setpagedevice** operator's jogging parameter.

Command	**defaultjogmode**
Syntax	**defaultjogmode** *integer*
Purpose	Reports the default jogmode.

Notes	If you change the default value for jogging it does not affect the current job. However, if the default value is changed, the engine's nvram values for jogging are also changed.
Errors	limitcheck, stackoverflow

Command	setdefaultjogmode
Syntax	*integer* setdefaultjogmode --
Purpose	Sets the default jogmode. This does not take effect until the start of the next job.

Parameter	*integer*
Range	0 to 4 0—Do not jog 3—Jog at each set
Notes	If you change the default value for jogging it does not affect the current job. However, if the default value is changed, the engine's nvram values for jogging are also changed.
Errors	rangecheck, stackunderflow, typecheck

CCITT Group 3 and 4 Commands

The following new CCITT group 3 and 4 commands are supported on the 4525 Print System. See the *QMS Crown Technical Reference Manual*, for information on all other supported CCITT commands.

Command	%%DPI
Syntax	%%DPI(*horizontal vertical*)
Purpose	Sets the horizontal and vertical dots per inch to be used for image expansion.

Parameter:	horizontal
Purpose	Sets the horizontal dots per inch
Default	Current engine resolution (300)
Range	1 to 9999

Parameter	vertical

Purpose	dots per inch
Default	Current engine resolution (300)
Range	1 to 9999

QMS Document Option Commands (DOC)

The following new or updated DOC commands are supported on the 4525 Print System (with the optional stacker/stapler unit). See the *QMSCrown Document Option Commands* manual, for information on all other supported DOC commands.

» Note: If a given DOC command, with the exception of the remove command, is specified more than once, the first command received is the one that will be executed. In the following example:

%%IncludeFeature: remove(6 1 macro) remove(6 5 font)

The remove(6 1 font) command is executed and the remove(6 5 macro) command is ignored.

The comma character is not a valid parameter separator (the space character is) when using QMS DOC commands.

Lineprinter Emulation

Command:	Lineprinter Orientation
Syntax:	**%%IncludeFeature: lporientation***(value)*
Purpose:	Specifies the default orientation of the lineprinter document images before they are placed on the sheet.

Parameter:	value
Purpose:	Specifies the rotation of the lineprinter document sheets.
Default:	portrait
Range:	portrait, landscape
Notes:	Portrait orientation has the y axis parallel to the long edge of the page. Landscape orientation has the y axis parallel to the short edge of the page.

This command applies only to the Lineprinter emulation. The only way to set the page orientation for the lineprinter is by setting LPorientation either through the Configuration menu or through this DOC command.

The default orientation for the lineprinter is specified through the printer's Configuration menu and this default setting overrides the standard **pageorientation** DOC command.

LN03 Plus Emulation

Command:	Print Orientation
Syntax:	**%%IncludeFeature: orient(*value*)**
Purpose:	Specifies the orientation that the LN03 plus emulation will use.

Parameter:	value
Purpose:	Specifies the rotation of the LN03 plus emulation document sheets
Default:	portrait
Range:	portrait,landscape
Notes:	Portrait orientation has the y axis parallel to the long edge of the page. Landscape orientation has the y axis parallel to the short edge of the page.
	This command applies only to the LN03 plus emulation. The LN03 plus emulation ignores the orientation set through the Configuration / Operator Control menu.

Document Formatting

This section contains information on the document formatting layout feature. Layout is the QMS DOC mechanism for specifying the format of a document. The QMS DOC layout options are prepended to page description language files being printed on your QMS printer. Typical layout options are page grids, booklets, borders, backgrounds, scaling, borders, offsets, and page range. These features are useful with files in page description languages such as PostScript, Lineprinter, and HP-GL.

Layout Terminology

Border

The rectangles formed after applying the physical sheet size, orientation, margins, number of rows and columns, and the row and column spacing (in that order) are called logical page spots. When borders are selected, they are drawn at the logical page spot.

Logical page

A logical sheet or logical page is the image that is produced by the emulation. When no layout is selected, it corresponds to the physical page (the paper size or paper type), but when a complex layout is selected, it is one of the images that gets mapped to a physical page within the borders.

Margins

The portion of the physical page around the edges of the paper where no imaging will take place.

Page grid

The placement of logical pages as tiles on the physical page.

Page spot

The page spot is each of the resulting rectangles after applying the following steps when a layout is specified:

1   Choose a paper size.

2   Orient the paper size.

3   Obtain a smaller rectangle by carving out the margins.

4   Divide up the resulting rectangle according to the geometry specified by the pagegrid or booklet commands.

Command: Printing Borders
Syntax: **%%IncludeFeature: border(*value*)**
Purpose: Draws a border at the page spot. The width of the
                 border (thickness of the stroke) is given by the value
                 whose units are centipoints (1/7200 inch). The
                 outside of the border corresponds to the rectangle
                 defined by the page spot so the thickness of the
                 border is entirely within the page spot.

Parameter:	value
Purpose:	Specifies the number of centipoints for the border.
Default:	0
Range:	0 to 7200 centipoints (0 to 1 inch) 1/7200—1 centipoint (.0001388 inch) 0 or no value— indicates that borders are not drawn.

When scaling is specified, the logical page is
guaranteed to fit inside the page spot and border,
preserving its proportions (or aspect ratio). When
scaling is not specified the logical image will most likely
be larger than the page spot, so the logical page will be
clipped to the size of the page spot. In this case, the
upper left corner of the logical page will be visible
(unless the DOC **%%IncludeFeature: pageoffsets**
command is specified to displace the logical page with
respect to the page spot).

This command is useful for separating logical pages
when the **pagegrid** or **booklet** command is enabled.

These examples show that by altering the margin values and inner
spacing values, the width, the height, and positioning of the border-
schange accordingly. The resulting rectangles (borders) in these
examples are

- ◼ **Not** the logical pages.

- ◼ Also called page spots.

The borders in Example A are 72 centipoints wide (1/100 inch).

Example A

```
%!
%%Title: Border (72 centipoints)
%%IncludeFeature: emulation(postscript)
%%IncludeFeature: pagesize(letter)
%%IncludeFeature: border(72)
%%IncludeFeature: margins(1800 1800
1800 1800 off)
%%EndComments
```
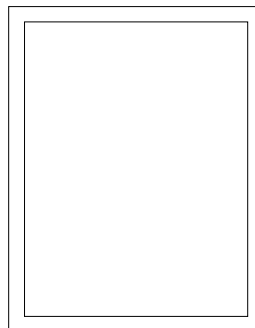
The borders in Example B are 1800 centipoints wide (1/4 inch).

Example B

```
%!
%%Title: Border (1800 centipoints)
%%IncludeFeature: emulation(postscript)
%%border(1800)
%%IncludeFeature: margins(1800 1800
1800 1800 off)
%%EndComments
```
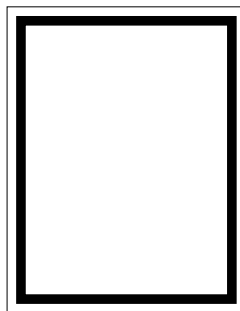
The borders in Example C are 7200 centipoints wide (1 inch).

Example C

```
%!
%%Title: Border (7200 centipoints)
%%IncludeFeature: emulation(postscript)
%%border(7200)
%%IncludeFeature: margins(1800 1800
1800 1800 off)
%%EndComments
```
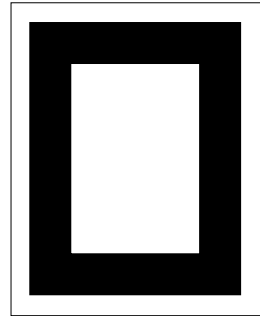
Sessions

What is a Session?

A session is a means of grouping multiple documents, including documents created in different emulations, to form one larger document which can be treated as a single entity by QMS Crown printers.

Terminology

We'll use these definitions when discussing Sessions:

Subjob	What we would normally call a document; that is, a single print job in any supported page description language.
Document	A group of smaller jobs, combined through QMS sessions Document Option Commands, to apply global printing attributes.
Session	The QMS mechanism for applying global printing attributes to multiple documents.

Despite their different printer description languages, subjobs can be combined in a single session that maintains global features, such as duplex mode, copy count, document layout, and collation. A session also gives you the flexibility to override the major document's global printing attributes for one or more subjobs.

Some printer description languages support language-specific markers which work well when the complete document is composed of a single printer description language generated by a single application. However, language-specific markers do not work very well when you need to create a document from files using multiple printer description languages. In such cases, high-level document manipulation applications find it difficult to deal with markers without taking into account the language and semantics of the language-specific delimiters.

Sessions solve that difficulty by offering a language-independent means of combining multiple subjobs.

Advantages

The Sessions mechanism increases productivity by allowing you to more efficiently print jobs which share one or more printing attributes.

Applications

You might want to use sessions to

- Print "wild card" file selections on UNIX or VMS computer systems.

- Print the chapters of a technical manual, such as this one, as a single document.

- Print a series of different monthly, weekly, or yearly reports as a batch process.

How is a Session Used?

A session is invoked by the DOC **%%Session** command. Language-independent delimiters included in the command allow any data

acceptable to an emulation, including 8-bit data, to be transferred to the printer without terminating documents or subjobs early and out of context.

» Note: The session mechanism is supported only for optional network interfaces on QMS Crown printers at this time. It is not supported for jobs submitted through any other interface — LocalTalk, parallel, or serial. Use of the %%Session command in print jobs submitted over non-network communication channels may lead to incorrect or erroneous output.

Session Command Location

The **session** command must

■ Be placed at the beginning of the data stream of a document to delimit the session boundaries.

■ Precede all of the data that belongs to an individual subjob. This will ensure that the command is not saved in the actual data stream that is passed to a language or emulation.

Some host applications add DOC commands at the beginning of a document's data stream before transmitting a job to the QMS Crown printer. If you do not ensure that such features are completely dis-abled, the processing of the **%%Session** command will be termi-nated, and unexpected results may be printed.

Alternatively, if FTP is used to transmit a document to a QMS Crown printer supporting the **%%Session** command, the following ftp com-mand must be entered prior to sending a file to the printer:

cd no_doc_cmds

The default mode of the FTP protocol for the QMS Crown printer adds network addressing information, in the form of DOC commands, to the start of a job and this data would also terminate the session.

Session Command

Syntax	**%%Session: *mode argument terminator***
Purpose	Signal the start of a subjob within a session.
Parameter	***mode argument***
Purpose	Specify the argument of the **%%Session** command.
Default	none (job does not consist of subjobs)
Range	0 *length*—Specifies the byte count for the end of subjob. The maximum possible value is 2147483647. A length of 0 means ignore the byte count terminator. The *length* excludes the **%%Session** command

2 *delimiter string*—Specifies the host-supplied *delimiter string* for the subjob boundary.

4 *delimiter string*—Specifies the host-supplied delimiter string for the subjob boundary. After detection of the string, all characters up to the next occurrence of a terminator, or up to 256 characters for the line, are absorbed.

» Note: The delimiter string must consist of printable ASCII characters. It may not contain ASCII spaces, carriage return, or line feed. A delimiter of "null" means ignore the delimiter string terminator. The maximum value of the delimiter string is 32 bytes or characters.

Notes Since each subjob may use a different end-of-subjob argument, the **%%Session: ...** command sequence must be inserted at the beginning of each subjob to specify the end-of-subjob argument for that particular subjob. There are two methods to signal the end of a subjob, end by count and end by delimiter. Both methods may be used within one document, but each subjob may only use one method.

End by Count—You can specify how many bytes are contained in the current subjob. After the printer reads the required number of bytes within the current document, the printer knows that it has reached the end of the subjob. Any data which comes after this point, within the same connection, is treated as the beginning of the next subjob**.**

End by Delimiter String—You can specify a delimiter string to detect the end of a subjob. Make sure that the specified delimiter string does not exist in the actual content of the subjob, however, because it will end the subjob and treat all remaining data as a new subjob.

Parameter *terminator*

Default none

Range <CR>— carriage return
<LF>— line feed
<CR><LF>— carriage return plus line feed

Notes One or more ASCII space characters must be used to separate each item. Any extra characters between the *argument* and the *terminator* are discarded.

Session Command Detection and Arguments

At the start of a document data stream, the printer examines the initial bytes of data to see if it can match the **%%Session: ...** string. If the string is found, the *mode* and *argument* parameters are extracted to determine what kind of session matching is desired. If the initial bytes for the document do not match **%%Session: ...** or if there are errors in the *mode* and *argument* parameters to the command, the printer will act as if the command is not present in the job and default to the

use of language-specific terminators to end subjobs for the remainder of the document.

If a valid **%%Session** command is encountered, the printer processes all of the data up to the end of that subjob. Once the subjob terminates and more data arrives from the host computer, the printer checks again to see if the subsequent data consists of a new **%%Session** command to start the next subjob. Again, if the text at the start of the subsequent subjob does not match **%% Session: ...** or if there are errors in the *mode* and *argument* parameters to the command, the printer will act as if the command is not present in the job and default to the use of language-specific terminators to end the subjobs for the remainder of the document.

Session Command Examples

End by Count

For the end-by-count method of signaling the end of a subjob using a *length*, the byte count begins after the *terminator* following the **%%Session: ...** sequence. For example, counting starts with %! as the first 2 bytes in the following example:

```
%%Session: 0 65535
%!
%%IncludeFeature: emulation(postscript)
...
...
```

» Note: When using this method, include all white space and forms control characters inserted by the host system in the byte count.

End by Delimiter String

To group the three subjobs in the following example into a document using the end-by-delimiter string method, the new combined data stream may look like this:

» Note: Text written in the Tekton typeface is comment, not part of the job.

Open connection: data comes into the printer

> %%Session: 5 null
> %!
> %%IncludeFeature: emulation (postscript)
> %%EndComments
>
> ...
> *PostScript data*
> ...
> %%EndSubJob
> %%Session: 4 %%End2ndSubJob
> %!
> %%IncludeFeature: emulation (pcl5)
> %%EndComments
>
> ...
> *PCL 5 data*
> ...
> %%End2ndSubJob
> %%Session: 4%% End3rdSubJob
> %!
> %%IncludeFeature: emulation (impress)
> %%EndComments
>
> ...
> *imPRESS data*
> ...

Close connection

Subjob Terminator

If you want to group the three subjobs into a document using the %%**Session** command with subjob terminators, the new combined data stream may look like the following example.

» Note: An "empty" subjob terminator (such as %%Session: 0 0 or %%Session:
2 null) will be discarded as shown in the following example. This is what
"ignore" means in the definition of length described earlier in this appendix.
Also, in the following example at "define 2nd subjob boundary", the
%%Session: 0 7213 is the real %%Session command being executed. The
other %%Session commands (%%Session: 2 null and %%Session: 4) included
in the text are part of the job. Also note that the Tekton typeface (used in
this note) is used to signify comments that are not part of the job.

Open connection: data comes into the printer

%%Session: 0 0	Ignore line
%%Session: 1 null	Ignore line
%%Session: 4 %%EndSubJob	Define 1st subjob boundary
%!	
%%IncludeFeature: emulation (postscript)	
%%EndComments	
...	
PostScript data	
...	
%%EndSubJob	
%%Session: 0 7213	Define 2nd subjob boundary
%%Session: 2 null	Include in 2nd subjob
%%Session: 4 %%End2ndSubJob	Include in 2nd subjob
%!	
%%IncludeFeature: emulation (pcl5)	
EndComments	
...	
PCL 5 data	
...	
%%End2ndSubJob	
%%Session: 0 0	Ignore line
%%Session: 2%%End3rdSubJob	Define 3rd subjob boundary
%!	
%%IncludeFeature: emulation (impress)	
%%EndComments	
...	
imPRESS data	
...	

Close connection

Sessions Document Finishing Terminology

Newlayout

The **newlayout** command is the mechanism that allows groups of subjobs to use the same layout features. A layout may be specified once for an entire document or altered for individual subjobs using the **newlayout** command.

Collation range

Collation range is a group of consecutively delivered pages to which the same settings of collation and offset parameters apply. When collation is On, the set of pages can match the collation range. But when collation is Off, collation range and set are not the same.

Set

If collate is on, the set is one copy of all pages in the document. If collate is off, the set consists of all the copies of a single page in a document.

Document Finishing DOC Commands

Command	Collate Document
Syntax	**%%IncludeFeature: collate(** *value***)**
Purpose	Enables or disables collation of multiple copies.
Parameter	*value*
Default	Control panel specific. See the Configuration menu if the command is not present.
Range	on, off
	on—Enables collation.
	off—Disables collation.
Notes	If the command is used but the value is omitted or is outside of the range for the command, the printer's Configuration menu value is used.

Command	Enable Stapling
Syntax	**%%IncludeFeature: staple** *(value)*
Purpose	Enables or disables stapling.
Parameter	*value*
Range	on, off
	on—Enables stapling after each set.
	off—Disables stapling.
Notes	A stapling value specified through QMS DOC overrides any specification from the printer's Configuration menu.

Command	Enable Offset Stacking
Syntax	**%%IncludeFeature: offset** *(value)*
Purpose	Enables or disables offset stacking/jogging.
Parameter	*value*

Range	on, off
	on—Enables jogging after each set.
	off—Disables jogging.
Notes	A jogging value specified through QMS DOC overrides any specification from the printer's Configuration menu.
	Offset stacking or jogging is applied after a job or set prints on the QMS 4525 Print System.

Command	Start New Layout
Syntax	**%%IncludeFeature: newlayout(*value*)**
Purpose	Used when a document has more than one subjob and you want to control whether different subjobs have the same format.

The **%%IncludeFeature: newlayout** command is used in sessions between subjobs to do one or both of the following:

- ■ Indicate to the printer that new document formatting options such as grids, booklets, borders, margins, page sizes, page offsets, and orientation, should apply from this point on.

- ■ Indicate that a new collation range is to take effect from this point on. This command is intended for use when multiple small documents are combined into a single print job in order to control which QMS formatting or finishing command settings may be changed and when they take effect.

Parameter	*value*
Default	n/a

Range   off, on, collate, on collate

off—Ignores any changes to layout or collation properties specified at this subjob boundary via DOC. The layout and collation properties in effect with the previous subjob remain in effect. This command is equivalent to the absence of the **%%IncludeFeature: newlayout** command altogether.

on—Any QMS DOC settings for standard commands (such as layout, document finishing, or document formatting) which are specified in the current subjob will replace the previous values of these settings inherited from the previous subjobs. All other settings inherited from the previous subjobs in the document remain unchanged. This subjob will be considered part of the collation range established by the previous subjob. See the "Collation Range" definition earlier in this document.

collate—Create a new collation range, but retain the same layout and document formatting options that were in effect with the prior subjob. For example, in the following two subjob sessions:

Subjob A
%!
%%IncludeFeature: numcopies(10) staple(on)
...
PCL 5 Data
...
Subjob B
%!
%%IncludeFeature:newlayout(collate)
%%IncludeFeature: numcopies(25) staple(off)
...
PostScript Data

In this example, all of subjob A would print with its attributes (e.g., numcopies, stapling, and other layout, document format, or document finishing commands. When that job is completed, subjob B would print s 25 copies with all other attributes unchanged).

on collate—Allows a change in both the layout properties and in the collation properties at this subjob boundary. Any QMS DOC settings for standard commands (such as layout, document finishing, or document formatting) which are specified in the current subjob will replace the previous values of these settings inherited from the previous subjobs. All other settings inherited from the previous subjobs in the document remain unchanged. This setting is a combination of the on and collate parameter values.

Notes   Newlayout **on collate** is always issued at the beginning of the document for the first subjob regardless of the actual command specified by the user. Newlayout **off** is assumed for subsequent subjobs when the command is not present.

About Collation, Stapling, and Jogging

The following sections contain many examples and tables to explain the collation, stapling, and jogging features of the QMS 4525 Print System. The following conventions are used in the example and tables:

Example Conventions

Throughout this section, you will see collation, stapling, and jogging examples. In the depictions of these examples, keep in mind that the pages on the bottom print first because your printer has a face down paper tray (except for the standard output bin which is rarely used).

Also when sets are shown, the lower numbered sets print first followed by the next higher numbered set until all sets are printed. Offset stacking or jogging is applied after a job or set has printed on the QMS 4525 Print System. So jogging is represented using dotted lines

when jogging occurs at the end of the last set being depicted in the example.

Table Conventions

In the output column of tables in this section, each page is identified by an uppercase letter indicating which subjob the page belongs to, and by a digit indicating the page number within the subjob. For example, "A1" indicates the first page within subjob A. The set or collation range boundaries are delimited by parentheses "( )". Stapled ranges of pages are delimited by square brackets "[ ]". Offset ranges are delimited by the "/" character.

Collation

The collation range can be the entire session, each subjob, or a group of subjobs. Collation range boundaries are defined by using the DOC newlayout (on collate) or newlayout (collate) command.

For example, a two copy, 2 page job which is a collation range in and of itself (pages 1 and 2) with collation set to Off has 2 sets: (page 1, page 1) and (page 2, page 2). If collation is set to On for this same job, the sets would be (page 1, page 2) and (page 1, page 2). The illustration below shows an example of the effect of collation on a one subjob session, and a one copy, two page document.
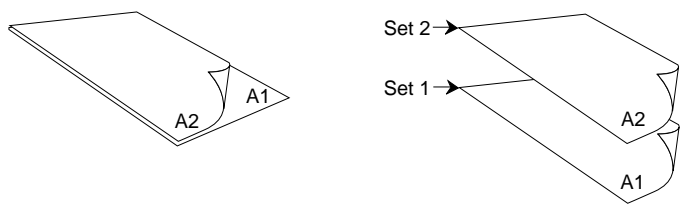
Single-Copy Subjob (Collation is On)   Single-Copy Subjob (Collation is Off)

The examples above show that there is no difference in the printing order for a single copy of a document. But in contrast, the examples below show what happens when multiple copies is added to this same scenario.

Set 2 →   A1
Set 1 →   A2

Set 2 →   A2
Set 1 →   A1
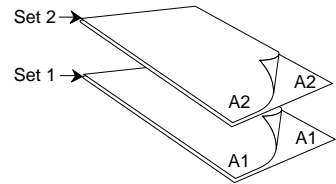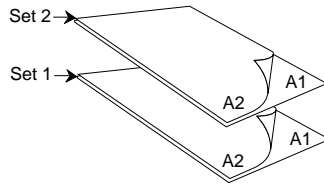
Multiple-Copy Subjob (Collation is On)   Multiple-Copy Subjob (Collation is Off)

For a multiple copy document with collation On, there must be enough display list memory to hold the display list blocks (R1) for all pages in the collation range. If there is not enough memory, then a boundary is forced after the last compiled page of the collation range.

Chunk Collation

This mechanism of introducing a forced boundary is known as chunk collation. Chunk collation breaks a document into several smaller, more manageable sets. For example in the illustration below, copies "a" and "b" of each set must be manually combined to create one col-

lated document. The order of printing is copy 1(a), copy 2(a), copy 3(a), copy 4(a), copy 1(b), copy 2(b), copy 2(c), and copy 2(d).
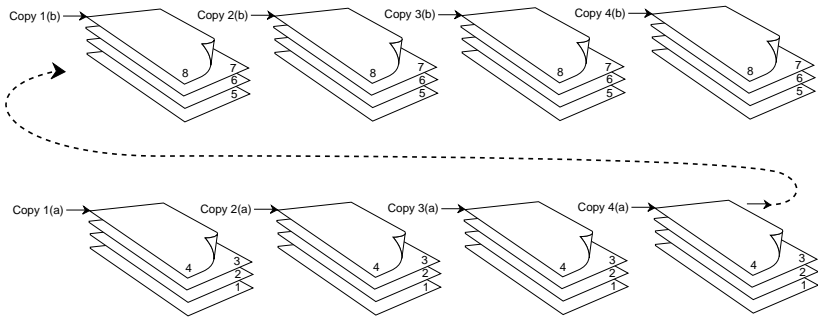
Collation Advantage

The main advantage of collation is user convenience and the time savings derived from not having to separate and sort individual copies of a document. Each copy of the document exists as a whole set unless chunk collation has occurred.

Controlling Collation

The settings for collation and number of copies can be controlled by the following means (with a priority corresponding to the order in which they are given):

1   Emulation (application or printer language)

2   QMS DOC (this includes the network print commands)

3   Configuration menu (Control panel or console default)

Using the Emulation

Some emulations are capable of specifying collation through language-specific mechanisms such as the QMS-developed PostScript emulation (level 2):

< /Collate true > setpagedevice % collate on
< /Collate false > setpagedevice % collate off

There is also a systemdict operator (level 1 or 2):

systemdict begin true _setcollation end % collate on
systemdict begin false _setcollation end % collate off

A collation value specified through the emulation overrides any speci-
fication from the QMS DOC **collate** command or from the printer's
Configuration menu.

Using QMS DOC

A collation value specified through QMS DOC overrides any specifi-
cation from the printer's Configuration menu. (See the **collate** com-
mand, described earlier on this appendix, for more information on this
command.) You can use network print commands to set collation.
These commands are converted to QMS DOC commands onthe
QMS 4525 print system.

» Note: The QMS 4525 printer supports setting collation from the emulation.

Using the Configuration Menu

The printer's Configuration menu allows you to set the default colla-
tion value through the control panel or the console. This default colla-
tion setting is used in the absence of an emulation or DOC collation
setting (at the start of a session only).

Setting Collation

The value for the collate command is set at the beginning of the first
subjob in a session and applies to all subsequent subjobs in the ses-
sion up any subjob that has %%IncludeFeature, with the exception of
a subjob that has **%%IncludeFeature: newlayout(on collate)** in the
DOC header to explicitly start a new collation range. The **newlayout**
command is described earlier in this appendix.

The value for the stapling command is set at the beginning of the first
subjob in a session and applies to all subsequent subjobs in the ses-

sion up to any subjob that has %%IncludeFeature, with the exception of a subjob that has **%%IncludeFeature: newlayout (on collate**) in the DOC header to explicitly start a new collation range. The **newlay-out** command allows the system defaults, the DOC **staple** command, or the value indicated in setpagedevice to be taken into consideration. The new stapling values will be in effect from this subjob boundary until the beginning of the next subjob that issues a **newlayout (on collate)** command which is the method to change the staple option within a session.

Collation Examples and Depictions

This example shows a two subjob session using the **collate** command.

Example A: (Two Subjob Session Using Collation)

```
%!
%%Title: Subjob A
%%IncludeFeature: emulation(postscript)
%%IncludeFeature: numcopies(2) collate(on)
...
Collate subjob A text
...
%!
%%Title: Subjob B
%%IncludeFeature: emulation(postscript)
%%IncludeFeature: numcopies(2) collate(off)
...
Collate subjob B text
...
%%End
```

The illustrations below show the output for this session. In the example on the left, in subjob A collation is on, in subjob B collation is off, but there is no newlayout(on collate), so subjob B is collated as well.

In contrast, the example on the right shows the same session with
newlayout(on collate) added to subjob B.
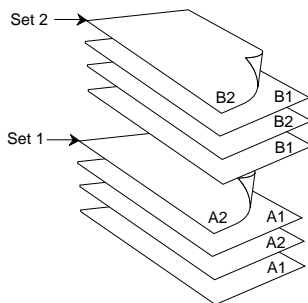
Two-Subjob Session (Collation is On)   Two-Subjob Session (Newlayout Example)
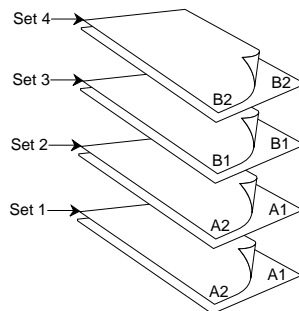
Controlling Stapling

If your printer has a stacker/stapler installed, you can staple sets or
jobs of up to 35 sheets in the upper-left corner. As in the case of colla-
tion, the priorities of the staple settings are dictated first by what the
emulation specifies, then by what DOC selects, and finally by the
default settings (specified through the printer's Configuration menu
using the control panel or theconsole). A stapling value specified
through the emulation overrides any specification from the QMS DOC
staple command or from the printer's Configuration menu. (See the
"Example Conventions" and "Table Conventions" sections earlier in
this chapter.

Using QMS DOC

The QMS 4525 Print System supports the DOC **staple** command. A
stapling value specified through QMS DOC overrides any specifica-

tion from the printer's Configuration menu. (See the **staple** command, described earlier in this appendix, for more information on this command.) You can use network print commands to set stapling. These commands are converted to QMS DOC commands on the QMS 4525 print system.

» Note: The QMS 4525 printer supports setting stapling from the emulation.

Stapling and Collation

The value for the stapling command is set at the beginning of the first subjob in a session and applies to all subsequent subjobs in the session up to any subjob that has %%IncludeFeature, with the exception of a subjob that has **%%IncludeFeature: newlayout (on collate**) in the DOC header to explicitly start a new collation range. The **newlayout** command allows the system defaults, the DOC **staple** command, or the value indicated in setpagedevice to be taken into consideration. The new stapling values will be in effect from this subjob boundary until the beginning of the next subjob that issues a **newlayout (on collate)** command which is the method to change the staple option within a session. The **newlayout** command is described earlier in this appendix. (See **setstaplemode** in the "Statusdict Operators" section of this appendix for information the stapling.)

The following table illustrates the behavior of stapling using a single two-page subjob. See the "About Collation, Stapling, and Jogging" section, for information on conventions used in this table.

Example	Copies	Collate	Staple Boundary	Output
A	1	On	Job	[(A1 A2)]
B	1	On	Set	[(A1 A2)]
C	1	Off	Job	[(A1) (A2)]
D*	1	Off	Set	(A1) (A2)
E	2	On	Job	[(A1 A2) (A1 A2)]
F	2	On	Set	[(A1 A2)] [(A1 A2)]
G	2	Off	Job	[(A1 A1) (A2 A2)]
H	2	Off	Set	[(A1 A1)] [(A2 A2)]

*No stapling occurs in this example because there must be at least two sheets for stapling to occur.

Stapling and Collation Examples

The following seven figures illustrate the examples shown in the table above.
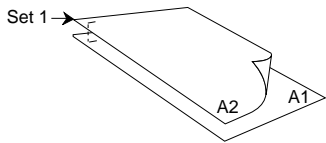
Examples A and B - Collate/Staple   Example C - Collate/Staple
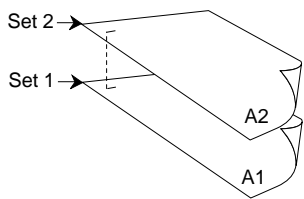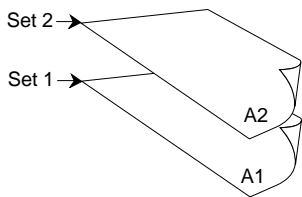
Example D - Collate/Staple   Example E - Collate/Staple
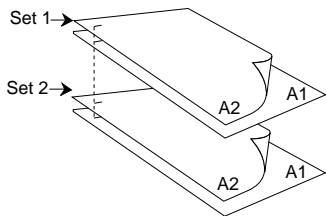
Set 2 →   A2 A1
Set 1 →   A2 A1
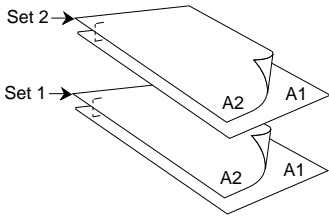
Example F - Collate/Staple   Example G- Collate/Staple
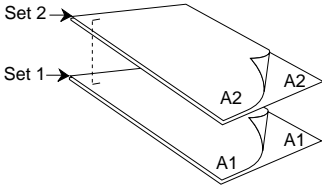
Set 2 →   A2
Set 1 → A1
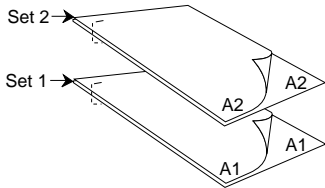
Example H- Collate/Staple

The following example illustrates how stapling may be selectively
applied to subjobs within a session:

```
%!
Title: Subjob A
%%IncludeFeature: staple(off) collate(on) numcopies(2)
```

```
...
Subjob A two sample pages
...
%!
%%Title: Subjob B
%%IncludeFeature: newlayout(on collate) numcopies(2)
<< /Staple 2
   /Collate false
>>setpagedevice
...
Subjob B two sample pages
...%!
Title: Subjob C
%%IncludeFeature: newlayout(on collate) numcopies(2)
<< /Staple 0
    /Collate true
>>setpagedevice
...
Subjob C two sample pages
%%End
```

The illustration below shows how the job would print.
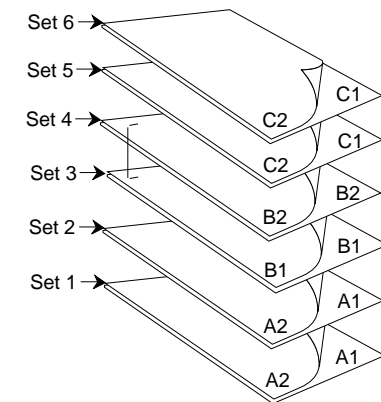
Stapling within jobs

For the purposes of stapling, an internally generated header page is considered a separate collation range. Internally generated trailer pages are treated similarly. The illustration below shows the effects of stapling on a simple two copy, two page job with headers and trailers turned on and stapling on set boundaries.

» Note: If there is more than one header or trailer page, then those pages will be stapled separately (i.e., all headers stapled together and all trailers stapled together).

Stapling with Headers and Trailers

Controlling Jogging

Jogging, also called offset stacking separates multiple copies of print jobs by offsetting alternating sets by 1.06" (27 mm). As in the case of collation and stapling, the priorities of the jogging settings are dictated first by what the emulation specifies, then by what the DOC selects and finally by the default settings (specified through the printer's Configuration menu via the control panel or the console). A jogging value specified through the emulation overrides any specification from the

QMS DOC **%%IncludeFeature: offset** command or from the
printer's Configuration menu.

Using QMS DOC

The QMS 4525 Print System supports the **offset** command. A jog-
ging value specified through QMS DOC overrides any specification
from the printer's Configuration menu. (See the **offset** com-
mand,described earlier in this appendix, for more information on this
command.) You can use network print commands to set jogging.
These commands are converted to QMS DOC commands on the
QMS 4525 print system.

» Note: The QMS 4525 printer supports setting jogging from the emulation.

Jogging and Collation

The value for the jogging command is set at the beginning of the first
subjob in a session and applies to all subsequent subjobs in the ses-
sion up to any subjob that has %%IncludeFeature, with the exception
of a subjob that has **%%IncludeFeature: newlayout (on collate**) in
the DOC header to explicitly start a new collation range. These **new-
layout** command allows the system defaults, the DOC **offset** com-
mand or the value indicated by setpagedevice to be taken into
consideration. The new jogging values will be in effect from this sub-
job boundary until the beginning of the next subjob that issues a **new-
layout (on collate)** command which is the method to change the
jogging option within a session. The **newlayout** command is
described earlier in this appendix. (See **setjogmode** in the "Status-
dict Operators" section of this appendix, for information on jogging.)

The following table illustrates the behavior of jogging using a single
two-page subjob. See the "About Collation, Stapling, and Jogging"
section, for information on conventions used in this table.

Example	Copies	Collate	Jog Boundary	Output
A	1	On	Job	(A1 A2) /
B	1	On	Set	(A1 A2) /

Example	Copies	Collate	Jog Boundary	Output
C	1	Off	Job	(A1) (A2) /
D	1	Off	Set	(A1) / (A2) /
E	2	On	Job	(A1 A2) (A1 A2) /
F	2	On	Set	(A1 A2) / (A1 A2) /
G	2	Off	Job	(A1 A1) (A2 A2) /
H	2	Off	Set	(A1 A1) / (A2 A2) /

Jogging and Collation Examples

The following seven figures illustrate the examples shown in the table above.
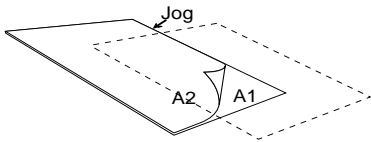
Example A and B - Jog/Collate
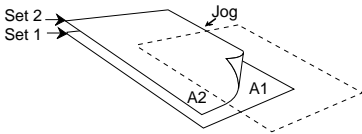
Example C- Jog/Collate
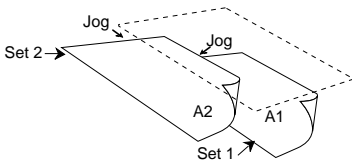
Example D - Jog/Collate
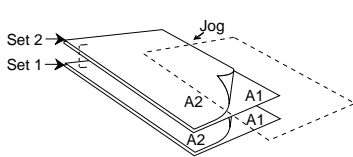
Example E- Jog/Collate
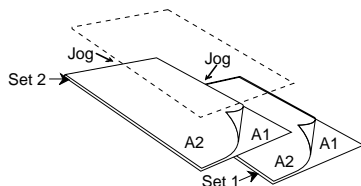
Example F - Jog/Collate   Example G- Jog/Collate
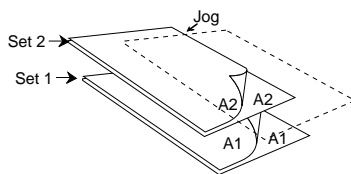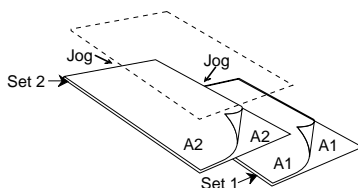
Example H- Jog/Collate

The following example illustrates how jogging may be selectively
applied to subjobs within a session:

```
%!
Title: Jogging Subjob A
%%IncludeFeature: offset(off) collate(on) numcopies(2)
...
Two sample pages
...
%!
%%Title: Jogging Subjob B
```

```
%%IncludeFeature: newlayout(on collate) numcopies(2)
<< /Jog 3
     /Collate false
>> setpagedevice
...
```
Two sample pages
```
...%!
Title: Jogging Subjob C
%%IncludeFeature: newlayout(on collate) numcopies(2)
<< /Jog 0
     /Collate true
>> setpagedevice
...
```
Two sample pages
```
...
%%End
```

The following illustration shows how the session would print.
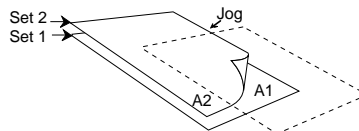
Jogging with Subjobs

For the purposes of jogging, an internally generated header page is considered to be the first page of the first collation range. Internally generated trailer pages are considered to belong to the last collation range. The illustration below shows the effects of jogging on a two

copy job with headers and trailers turned on and jogging on set
boundaries:
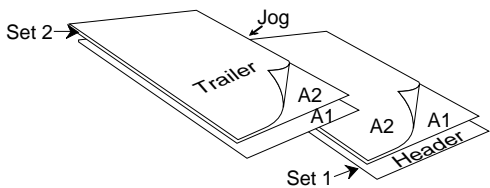
Jogging with Headers and Trailers

Combining Stapling with Jogging

The QMS 4525 Print System can offset stack after stapling. Prece-
dence is given to stapling when deciding offset boundaries. The fol-
lowing table illustrates the behavior of jogging combined with stapling
in the following requests for a two-copy collated job. In example B of
this table, the jog boundary is at the job boundary and the staple
boundary is at the set boundary. Since stapling takes precedence,
both jogging and stapling occurs at the job boundary. See the "About
Collation, Stapling, and Jogging" section, for information on conven-
tions used in this table.

Example	Jog Boundary	Staple Boundary	Output
A	Job	Job	[(A1 A2) (A1 A2)] /
B	Job	Set	[(A1 A2)] / [(A1 A2] /
C	Set	Job	[(A1 A2) (A1 A2)] /
D	Set	Set	[(A1 A2)] / [(A1 A2)] /

Stapling and Jogging Examples

The two figures below illustrate the examples shown in the table above.
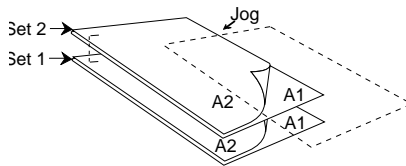
Examples A and C - Staple/Jog   Examples B and D - Jog/Staple
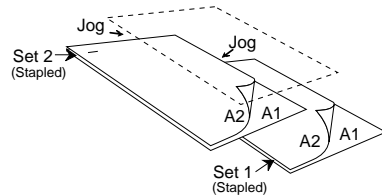
PCL 5 Emulation Terminology

Resource

A resource is a location where downloaded objects such as fonts, macros, or patterns are stored. The printer has one default resource, and one additional resource for each attached disk. All downloaded objects are stored in file systems which reside on these resources. The RAM1: resource may be used as the default, but systems with at least one disk use the system disk instead. So, for any disk-equipped printer, all downloaded objects (except palettes which require special handling) are stored on disk. The default resource and one of the additional resources can reside on the same disk, but they will be located in different directories of that resource's file system.

Object

The following are the three types of PCL downloaded objects:

■ Temporary

These objects reside on the current resource, and they are deleted either at the beginning and end of a job (unless Retain Temporary is set to On or On Compatibility) or when the system is reset (<ESC>E or receipt of Printer Job Language).

■ Permanent

These objects reside on the current resource, and are retained when the system is reset (<ESC>E or receipt of Printer Job Language).

■ External

These objects reside on the additional resources.

All objects are temporary when first created. They can be made permanent objects through PCL commands. Both temporary or permanent objects can become external objects when the current resource is changed (for temporary objects Retain Temporary must be set to On, True, or On Compatibility). External objects become permanent when the resource in which they reside becomes the current resource.

User-downloaded PCL objects (with the exception of palettes) are identified by an ID when they are downloaded. The ID is usually set by the file performing the download. If not, the system will provide a default value (normally 0, but this can be set using the "install" DOC command). If two objects of the same type are provided with the same ID, the last one received replaces the former. From that point on downloaded objects are accessible by their IDs.

Fonts

Fonts are a unique set of objects that have an ID and attributes (symbol set, spacing, pitch, height, style, weight, and typeface number). A font is accessed by specifying a desired set of attributes. The system selects the font that most closely matches these attributes from the available set of fonts. See the *PCL 5 Emulation Technical Reference Manual* for information on what characterizes a PCL font.

There are two types of fonts: bound and unbound. A bound font supports a single symbol set. An unbound font supports multiple, but not all, symbol sets. With unbound fonts, the symbol sets are organized into two groups: normal and Dingbats. All downloaded fonts are bound, and all resident fonts (except Zapf-Dingbats which supports the Dingbats symbol set) support the group of normal symbol sets.

In the QMS PCL 5 emulation, only fonts located in the current resource may be accessed by a PCL font ID using the normal <ESC>(#X sequence. All other fonts (resident, cartridge, or other) including those stored on the additional resources can be accessed only by attributes.

Also, only objects stored in the current resource may be deleted directly by the PCL language. Thus, unless explicitly removed, external fonts are always available to all PCL jobs.

Font Index Numbers

In addition to its ID, a downloaded font also has an unique index number which is automatically assigned by the printer when the font is downloaded. This index number may change if new resources are added, but in practice it usually remains fixed. All currently available PCL fonts (resident, cartridge, temporary, permanent, and external) are listed with their font index numbers on the Advanced Status Page.

The font index number defines the *default* PCL font to be used if selectbyid is specified as the default PCL font. Do not confuse the font index with the PCL font ID, a mechanism used to identify downloaded fonts in the PCL language using the <ESC>(#X sequence. There is no way to specify fonts by their font index numbers from within the PCL language. Only the default PCL font is affected.

PCL 5 Emulation DOC Commands

Command	Disable Scalable
Syntax	**%%IncludeFeature: scalablefonts***(value)*
Purpose	Disables PCL 5 scalable fonts
Parameter	*value*
Purpose	Specifies whether to disable scalable fonts.
Range	0—Enable scalable fonts
	1—Disable scalable fonts
Default	0 Disables scalable fonts
Notes	Scalable fonts may be disabled to print PCL 4 documents which inadvertently select PCL 5 scalable fonts.

Command	Install Object
Syntax	**%%IncludeFeature: install***(resource id object id)*
Purpose:	Establishes the current resource and the default object ID value for the current job to which it is attached. If it is attached to a job that downloads a font without setting the current object ID using the PCL escape sequence <ESC>(#X, it has the appearance of "storing" the font on the disk.
Notes:	All downloaded objects are by default temporary, and will be deleted at the end of a job unless Retain Temporary is set to On or On Compatibility. If the file that the install command is attached to does not make its downloaded fonts permanent or Retain Temporary is not set, then those objects are removed from the disk when the job ends.
	A downloaded font can be accessed by its ID only if the font is stored in the current resource. Regardless of its resource, a font can be selected by its attributes. Example A below shows a pair of jobs that will not produce the desired results (subjob 2 only has the appearance of storing the font on disk). By contrast, examples B and C show a pair of jobs that will produce the desired results.

Example A - Job 1

%!
%%IncludeFeature: emulation(pcl5) install(6 20)
%%EndComments
<ESC>)s#W<<*download font header*>><ESC>*c33E
<ESC>(s#W<<*char 33 data*>><ESC>*c34E
<ESC>(s#W<<*char 34 data*>>... <ESC>*c5F

Example A - Job 2

<ESC>(20X*this text is NOT in the downloadedfont...*

Example B - Job 1

%!
%%IncludeFeature: emulation(pcl5) install(6 20)
%%EndComments
<ESC>)s#W<<download font header>><ESC>*c33E
<ESC>(s#W<<char 33 data>><ESC>*c34E
<ESC>(s#W<<char 34 data>>.. <ESC>*c5F

Example B - Job 2

**<ESC>(8U<ESC>(s1p12v0s0b4153*This text will be
in the downloaded font,*** if it supports the ROMAN-8
symbol set, is proportionally spaced, 12 points in height
(or scalable), upright, medium weight, and has type #
4153.

Example C - Job 1

```
%!
%%IncludeFeature: emulation(pcl5) install(6 20 )
%%EndComments
<ESC>)s#W<<download font header>><ESC>*c33E
<ESC>(s#W<<char 33 data>><ESC>*c34E
<ESC>(s#W<<char 34 data>>... <ESC>*c5F
```

Example C - Job 2

```
%!
%%IncludeFeature: emulation(pcl5) install(6)
%%EndComments
<ESC>(20Xthis text is also in the downloaded font...
```

Parameter	*resource id*
Purpose	Identifies one of the possible locations for downloaded objects.
Default	internal system disk
Range	0 to 6
Format	Integer
Notes	If no install command is sent, the internal default location is used; otherwise, this parameter, which must be provided, specifies one of the alternate locations. For most QMS printers, resource 6 is the system disk.

Parameter	*object id*
Purpose	Assigns an ID to an object such as a font, macro,or pattern.
Default	0
Range	0 to 32767
Format	Integer

Notes	The object ID can be used instead of the usual PCL command to assign an ID. This ID is overwritten by any ID assigned from the PCL print job, if present. If neither a DOC command nor the PCL print job specify an ID, the default ID of 0 is used. Identifiers must be unique. If the ID matches an ID for an existing object, that object is deleted and replaced by the new object. If a **remove** command precedes an **install** command, the **install** command is ignored (these two commands are mutually exclusive.)
Command	Remove object
Syntax	%%**IncludeFeature: remove***(resource id object id object type)*
Purpose	Removes an external object from the print system.
Notes	Unlike the **install** command, the **remove** command does not set any defaults, and it is not directly related to the job to which it is attached. This command allows you to remove external objects from the system without having to generate a job containing both the DOC command to set the appropriate current resource, and the PCL code to delete the desired object.
	If this command is specified more than once, the last command received is the one that will be executed. In the following example:
	%%IncludeFeature: remove(6 1 macro) remove(6 5 font)
	The remove(6 5 font) command is executed and the remove(6 1 macro) command is overwritten.
Parameter	*resource id*
Purpose	Indicates the resource from which the object is to be removed.
Default	n/a
Range	0 to 6
Format	Integer

Notes	This ID must be specified. It indicates the resource from which the desired object is to be removed. There is no way to specify "all resources". If an **install** command precedes the **remove** command, the **remove** command is ignored (these commands are mutually exclusive). If the disk does not exist, PCL issues the `NO SPACE FOR FONT, MACRO, OR PATTERN` error message.

Parameter	***object id***
Purpose	Specifies the ID of the object that is to be removed from the printer system.
Default	-1 (wild card)
Range	*, -1 to 32767
Format	Integer
Notes	If the *object id* is not specified, or it is specified as "*" or "-1", all objects on the specified resource with the specified object type are removed.

Parameter	***object type***
Purpose	Specifies the kind of objects that are to be deleted from the specified print system.
Default	n/a
Range	*, font, macro, pattern, or other object type
Format	Character
Notes	If ***object type*** is "*" or is not specified, then all objects on the specified resource with the specified object id are removed.

Command:	Remove Resource
Syntax	**%%IncludeFeature: removeresource*(resource id object id)***
Purpose	Identifies an external object that is to be removed from the print system.

Notes	This is an obsolete DOC command that is identical to the remove command, except that it does not allow specification of an object type. The DOC string "removeresource(aaa bbb)" is equivalent to "remove(aaa bbb *)".

Parameter	*resource id*
Purpose	Indicates the resource from which the object is to be removed.
Default	n/a
Range	0 to 6
Format	Integer
Notes	This ID must be specified. It indicates the resource from which the desired object is to be removed. There is no way to specify "all resources". If an **install** command precedes the **removeresource** command, the **removeresource** command is ignored (these commands are mutually exclusive). If the disk does not exist, PCL issues the NO SPACE FOR FONT, MACRO, OR PATTERN error message.

Parameter	*object id*
Purpose	Specifies the ID of the object that is to be removed from the printer system.
Default	-1 (wild card)
Range	*, -1 to 32767
Format	Integer
Notes	If the *object id* is not specified, or it is specified as "*" or "-1", all objects on the specified resource are removed.

Command	Select Font
Syntax	**%%IncludeFeature: font (*font name*)**
Purpose	Specifies the default font to use.
Parameter	*font name*
Purpose	Specifies the default font name.

Default	Printer configuration dependent
Range	courier12 times*blditalic
	courier12bold univ*
	courier12italic univ*italic
	courier10 univ*bold
	courier10bold univ*blditalic
	courier10italic univcond*
	lineprinter univcond*italic
	times* univcond*bold
	times*italic univcond*blditlc
	times*bold selectbyindex
Format	character
Notes	Fonts are identified by the names shown above. Only the resident fonts may be selected (the available set varies from printer to printer). An asterisk "*" in the name indicates that a font is scalable, and that a point size is to be applied. The value selectbyid indicates that the default font ID or unique font index will be used for default font selection. Selecting a bound, bitmap font overrides the default settings for symbol set and point size. An unbound font uses the specified default symbol set if possible, while a scalable font uses the default font size.

Command	Select Font ID or Index
Syntax	**%%IncludeFeature: fontid** *(id #)* **%%IncludeFeature: fontid** *(index #)*
Purpose	Specifies the default font ID or index number.
Parameter	*id #*
Purpose	Specifies the font ID of the default font.
Default	Selectbyid dependent
Range	0 to 32767
Format	Integer

Notes
This ID is used when the Default Font selected is selectbyid. This allows for selection of fonts only on the current resource. Using this command to specify a font ID as the default font and then using the Default Font command to select the selectbyid value overrides the symbol set value. You can override the symbol set only if a bound font is selected as the default value, or if an unbound font is selected that does not support the default symbol set. If a font with the same ID exists, it is selected as the Default Font. If the specified value does not exist, courier 12 point is substituted.

Command	Select Symbol Set
Syntax	**%%IncludeFeature: symbolset** *(name)*
Purpose	Specifies the default symbol set for the emulation.
Parameter	*name*
Purpose	Specifies the symbol set name.
Default	n/a

Range

roman-8	iso-60
pc-850	iso-61
pc8-us	iso-69
pc8-dn	iso-84
ecma-94	iso-85
legal	desktop
hpgerman	ps-math
hpspanish	math8
iso-2	microsoft-pub
iso-4	pi-font
iso-6	ps-text
iso-10	ventura-intl
iso-11	ventura-math
iso-14	ventura-us
iso-15	windows
iso-16	ps-zapf-dingbats
iso-17	ventura-dingbats
iso-21	zapf-dingbats100
iso-25	zapf-dingbats200
iso-57	zapf-dingbats300

Format   Character

Notes   This command specifies the default symbol set. Not all symbol
                   sets are available with certain resident fonts. In particular, the
                   Desktop, PS Math, Math 8, Microsoft Pub, Pi Font, PS Text,
                   Ventura Intl, Ventura Math, Ventura US, and Windows symbol
                   sets can not be used with the resident bitmap fonts: courier10,
                   courier10bold, courier10italic, courier12, courier12bold,
                   courier12italic, lineprinter.

                   The five dingbat symbol sets (PS-Zapf-Dingbats,
                   Ventura-Dingbats, Zapf-Dingbats100, Zapf-Dingbats200, and
                   Zapf-Dingbats300) can be used with all fonts. If a mismatch
                   between symbol set and font occurs, the standard PCL font
                   selection mechanism is used to locate a font that matches the
                   selected symbol set. With the standard set of fonts distributed
                   by QMS, this matches the Times* font, but other user installed
                   fonts could change this result.

Command   Set Carriage Return (Line Termination)

Syntax   **%%IncludeFeature: criscrlf** *(value)*

Purpose   Controls the default line termination mode (the ***<ESC>&k#G***
                   command). Specifies the line termination treatment of a
                   carriage return.

Parameter   *value*

Purpose   Specifies whether a carriage return is treated simply as a
                   carriage return, or as a carriage return-line feed combination.

Default   Printer configuration dependent

Range   on, off, true, false

                   Off/false—Treats line feed as a line feed.

                   On/true—Treats line feed as a carriage return-line feed
                       combination.

Format   boolean

Notes   The result of various settings for these parameters is shown in table below, in terms of the equivalent code passed to the PCL line termination command (***<ESC>&k#G***). The second setting (lfiscrlf on, criscrlf off) is correct for most ASCII listings printed from UNIX machines. PC listings should usually be done with both items set to off, and Macintosh listings usually require the third setting (lfiscrlf off, criscrlf on). The following table shows the criscrlf/lfiscrlf commands and the corresponding PCL Line Termination command parameters.

LFISCRLF	CRISCRLF	PCL CODE	COMMENTS
Off	Off	0	CR->CR, LF->LF, FF->FF
On	Off	2	CR->CR, LF->CR-LF, FF->CR-FF
Off	On	1	CR->CR-LF, LF->LF, FF->FF
On	On	3	CR->CR-LF, LF->CR-LF, FF->CR-FF

Command:	Set Linefeed (Line Termination)
Syntax:	**%%IncludeFeature: lfiscrlf (value)**
Purpose:	Controls the default line termination mode (the **<ESC>&k#G** command). Specifies the line termination treatment of a linefeed.
Parameter:	**value**
Purpose:	Specifies whether a linefeed is treated simply as a linefeed, or as a carriage return-linefeed combination
Default:	Printer configuration dependent
Range:	on, off, true, false
	Off/false⎯Treats linefeed as a linefeed.
	On/true⎯Treats linefeed as carriage return-linefeed combination
Format:	boolean
Notes:	The result of various settings for these parameters is shown in table above, in terms of the equivalent code passed to the PCL line termination command. The second setting (lfiscrlf on, criscrlf off) is correct for most ASCII listings printed from UNIX machines. PC listings should usually be done with both items set to Off, and Macintosh listings usually require the third setting (lfiscrlf Off, criscrlf On). Note that the FF becomes a CR-FF when the LF is a CR-LF.
Command:	Set Lines Per Page

Syntax:	**%%IncludeFeature: linesperpage *(#)***
Purpose:	Sets the default PCL line spacing.
Parameter:	***#***
Purpose:	Specifies the number of lines on the default page at the default orientation.
Default:	Printer configuration dependent
Range:	5 to 4096
Format:	Integer
Notes:	The Lines Per Page DOC command always overrides the front panel's setting of Lines Per Inch.

Command:	Set Point Size
Syntax:	**%%IncludeFeature: pointsize*(default font size)***
Purpose:	Specifies the point size for scalable default fonts.
Parameter:	***default font size***
Purpose:	Specifies the floating point number for point size.
Default:	Printer configuration dependent
Range:	0.25 to 999.75
Format:	Floating point number
Notes:	If the font is not scalable or if a bitmap font size is specified, this setting is ignored.

Command	Resource
Syntax	**%%IncludeFeature: resource*(resource id object code)***

Purpose	Establishes the current resource and the default object code value for the current job to which it is attached.
Notes	This command is identical to the **install** DOC command. It is included for backward compatibility.
	All downloaded objects are by default temporary, and will be deleted at the end of a job unless Retain Temporary is set to on, true, or on compatibility. If the file that the resource command is attached to does not make the downloaded font permanent and Retain Temporary is not set, then those objects are removed from the disk when the job completes.
	A downloaded font can only be accessed by its ID if the font is stored in the current resource. Regardless of its resource, a font can be selected by its attributes.

Parameter	*resource id*
Purpose	Identifies one of the possible locations for downloaded objects.
Default	internal system disk (usually DSK6:/BIN/EMULATE/PCL/FONTS
Range	0 to 6
Format	Integer
Notes	If no resource item is provided, the internal default location is used; otherwise, this parameter, which must be provided, specifies one of the alternate locations. For most QMS printers, resource 6 is the system disk.

Parameter	*object code*
Purpose	Assigns a code to an object such as a font, macro, or pattern.
Default	0
Range	0 to 32767

Format   Integer

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